MEDICAL REPOSITORY,

FOR

AUGUST, SEPTEMBER, AND OCTOBER, 1810.

Experiments and observations on the component parts of CANE-JUICE; *(Saccharum Officinarum of Linnæus;) by* WILLIAM M. ROSS, M. D. *Physician at Savanna-la-Mar, (Jamaica.)*

To SAMUEL L. MITCHILL, *Member of Congress, &c.*

DEAR SIR,

IT has been the anxious desire of the proprietors of sugar estates, many of whom now reside in England, to have a set of experiments made on Cane-Juice, in order, if possible, to ascertain its composition, and to discover greater facility in making and bettering the quality of their sugars. Most experiments have been directed to the clarification of the cane liquor, by means of filtration through woollen cloths, and to the hot and cold tempering with lime, &c.

As the territorial limits of the U. S. have been extended by the accession of Louisiana, the process of sugar-making will now become more generally than formerly the occupation of their citizens. Some hints may, perhaps, be taken from these experiments, which may prove useful, or lead to further researches on the subject.

Nonnunquam ex acido dulce germinat.

Respectfully, Yours,

WM. M. ROSS.

Savanna-la-Mar, March 4, 1809.

Jamaica, Parish of Westmoreland, April 8, 1808.
Fort-William Estate.

AFTER analyzing the water of the spring-head of Roaring River estate, and examining the magnificent grotto of petrifactions, so elegantly described by Wm. Beckford, Esq. in his descriptive account of Jamaica, I imagined some experiments might be instituted, in order to ascertain, by chemical analysis, the properties and component parts of the cane-liquor. Experiments, cautiously conducted, may, perhaps, develope some principles and qualities of this singular fluid, which have hitherto remained entirely unknown.

Of the Fresh Cane-Liquor.

Exp. 1. Litmus paper was immersed in the fresh cane liquor, at the instant of the expression, and as it flowed from the mill, in that state which the French call *vesou.* It did not exhibit any disengaged acid or acescency.

Exp. 2. Tinct. Tannin, (Gall. Querc.) when added to the fresh cane liquor, and suffered to remain at rest, it occasioned a separation of the mucilaginous and colouring matter into flocci, which remained for some time suspended in the liquor. In a few hours a brownish olive precipitate took place.

Exp. 3. Nitrate of quicksilver; two drops on the surface of a cubic inch of fresh cane liquor, instantly exhibited a milky whiteness, which gradually expanded in a white pellicle, and in a few seconds began to precipitate in white striæ.

Exp. 4. Nitrate of silver; three or four drops on a cubic inch of cane-juice, produced nearly thesame milky cloudiness and turbidity in the liquor, which afterwards slowly precipitated in cream-coloured striæ and nebulæ.

Exp. 5. Acetas Plumbi; a drop or two of this solution in distilled water, added to a cubic inch of the untempered or fresh cane juice, produced instantly a milky-coloured turbidity and separation of the mucilage, which soon collected in flocculi of a pale green, approaching to a yellow colour. This flocculence was supernatant, about three lines in depth, and afterwards, by subsidence, afforded a copious precipitate.

Of the Tempered Liquor, or Cane-Juice saturated with quick or pure lime; taken out of the syphon, in the boiling-house at Fort-William estate.

Exp. 1. Tinct. Tannin, quickly produced a separation of the mucilaginous and herbaceous matter, which accumulated in a flocculent state, and was suspended for some time in the liquor.

Exp. 2. Nitrate of quicksilver; a few drops added to the sediment or residuum, taken from the syphon in its greatest state of impurity, produced no alteration or decomposition.

Exp. 3. Murias hydrarg. oxigen. added to the tempered liquor, exactly saturated with lime and depurated by it, and then decanted off, did not exhibit any signs of it. Hence the lime used as temper must have entered into chemical combination with something in the cane-juice; otherwise it would have been detected, if it had been in a disengaged state.

Exp. 4. Murias hydrarg. oxigenat. half a grain, added to the impure cane-liquor, over-tempered or super-saturated with lime, by subsidence and rest for some hours, (from five o'clock in the morning to one in the afternoon,) assumed a reddish-brown colour, thereby detecting the surplusage of the lime, whilst the mucilage, &c. was precipitated.

Exp. 5. Acidum oxalicum, half a grain, deposited on the surface of a cubic inch of tempered or saturated cane-liquor, immediately produced a whitish appearance, which precipitated in white striæ, in form of oxalat of lime.

Exp. 6. Nitrate of silver; a drop or two instantly produced a milky turbidity, on a cubic inch of the cane-juice, saturated with lime, and precipitated in white striæ and nebulæ.

Exp. 7. Nitrate of quicksilver, produced much the same appearance, a milky turbidness and copious precipitate.

Experiments made in the boiling-house of Friendship Estate, the property of Lord Holland.

Parish of Westmoreland, April 9, 1808.

The above experiments on the tempered and untempered cane-liquor were repeated, under similar circumstances, in the boiling-house, and the result was the same. The following additional experiments were made.

Exp. 1. Pure lime or quick lime, mostly deprived of its carbonic acid, and such as is commonly used for temper, added to the fresh cane-liquor, at the point of saturation, does not so readily combine with the herbaceous and colouring matter, and precipitate it so effectually, as when the cane-liquor is over-tempered or super-saturated.

Exp. 2. Tinct. Tannin. added to the cane-liquor thus clarified or edulcorated by the precipitation, occasioned by the lime, does not appear to combine with any fresh portions of the mucilage, or to effect any further clarification.

Exp. 3. Sulphas aluminosus—On addition of this to the fresh cane-liquor, in its untempered state, a speedy separation of the herbaceous matter takes place, and considerable flocculency is effected, which, on subsidence, clarifies the liquor, and renders it a light greenish straw-colour, approaching to yellow.

Savanna-la-Mar, April 25, 1808.

Experiments on Lime-Water, with a view to ascertain, by comparison, when Cane-Liquor is tempered or over-tempered with Lime.

Exp. 1. Murias hydrarg.—A few crystals placed on the surface of a cubic inch of lime-water, were instantly discoloured, and let fall very beautiful striæ, which assumed a reddish-yellow appearance and precipitate.

Exp. 2. Acidum muriaticum—On its addition to a cubic inch of lime-water, so as to meet the exact point of saturation, or "temper", on the immersion of the litmus paper exhibited no change or predominance of lime or acid. The muriat. hydrarg. in some quantity, was placed on the surface of the subject, but no change whatsoever took place, nor was any portion of lime, however small, detected in a disengaged state.

Exp. 3. To the solution of the muriat of lime, as exhibited in the above trial, (and when at the exact point of saturation, and in so close a state of chemical union as not to be detected by the delicate precipitant employed,) lime-water was then added, in such quantity as to super-saturate, or "over-temper," the solution of the muriat of lime. As soon as this super-saturation was effected, dove-coloured striæ shot forth from the surface of the murias hydrarg. which was decomposed, and assumed a straw colour, which progressed

according to the predominance or surplusage of the lime, to the reddish-yellow precipitate of the first experiment.

The above experiments with lime-water and muriatic acid, illustrate those trials made in the boiling-house at Fort-William Estate, on the cane-liquor which was super-saturated, or overtempered with lime. (See fourth and fifth experiments with muriate of mercury.)

These experiments, at the same time that they develope one of the constituent principles, the muriatic acid, in cane-liquor, also point out, with facility and exactness, when the cane-liquor, or, to speak more correctly, its muriatic acid, is over-tempered or super-saturated with lime. Hence these experiments, if proved correct, may be of some practical utility, without the long, expensive, uncertain, and operose process, now commonly resorted to and practised in boiling-houses.

The chief difficulty in ascertaining the surplusage of lime, or over-temper, which now presents itself, is the extractive or colouring herbaceous matter in the cane-liquor; otherwise the same re-agent, or test, would discover the excess of lime with as much certainty as in the clear transparent lime-water. This want of so perfect pellucidity, will not, it is conjectured, render the trial useless or uninteresting to the inquisitive sugar-boiler.

When cane-liquor is over-tempered, or the muriatic acid it contains is super-saturated, the lime combines with the saccharine matter, its essential salt, and converts it into mucilage; thereby not only deteriorating the quality of the sugar, by adding to its discolouration, but also rendering it less in quantity.

The above tests are therefore offered to the consideration of sugar-boilers, in addition to the old mode of judging of tempered cane-liquor, by the bead formed on it when boiling.

Observations on the above Experiments.

After the cane-juice is completely depurated by Tannin, and the liquor is clarified, then add the nitrate of quicksilver, and observe whether white nebulæ and striæ are produced. This will probably shew that muriatic acid is the real cause, and prove its presence in the liquor. If no white striæ appear, it will tend to shew the white nebulæ are ow-

ing to the mucilage or gluten in the cane-liquor. Three grains of cherry-tree gum in a kanne of water, Bergman says, are detected by nitrate of mercury. Some remarks on this subject are made by Schwarz and Gottling, in 2 Med. and Phys. Journal, p. 390.

Experiments on Cane-Juice, made at Savanna-la-Mar, April 26, 1808.

Exp. 1. The fresh juice expressed from the violet-cane, on having the litmus paper immersed, produced no change, and did not shew the least acidity.

Exp. 2. The fresh juice of the same variety of cane, on having the gallic acid added in sufficient quantity, produced a separation of the herbaceous matter and mucilage, which soon precipitated of a dark drab colour, and clarified the liquor of the colour of Madeira wine. This clarification was also assisted by filtration through a flannel bag.

Exp. 3. One or two drops of this fresh cane-juice, thus clarified, being dropt into a cubic inch of lime-water, was followed by immediate combinations in the form of thick columns, and precipitations in flakes of the gallate of lime, of a purplish or rose-pink tinge on the top, and ivory colour at the bottom.

Exp. 4. An ounce of the above clarified cane-juice, on having two drops of the septite of silver added, produced instantly white nebulæ, which soon precipitated, evidently detecting the muriatic acid, which, combining with the silver, formed a luna cornea.

Exp. 5. Septas hydrarg. (nitrate of merc.) added to a portion of the same cane-liquor, clarified by tannin to the hue of Madeira wine, produced a thick white or cloudy pellicle, on the surface, which afterwards precipitated of a whitish colour and in flocci.

Exp. 6. Lime-water, to which a few drops of the gallic acid was added, produced ash-coloured nebulæ, with purple edges, and copious precipitation in ivory-coloured flakes.

Observations on the above.

These last experiments shew the clarification of cane-liquor by the acid of galls; that it predominates after the mucilage is precipitated; and that the lime combines with the said acid, and precipitates in the form of gallate of lime.

None of the above precipitants affected the saccharine parts of the cane-juice, as it was equally sweet afterwards.

In contemplating the above experiments on cane-juice, and the surprise I met with in detecting the *muriatic acid* as a constituent principle, I was led to conjecture that the juice of other plants, especially those fond of maritime situations, would also contain it. I accordingly procured a quantity of the *batis maritima* of Linnæus, growing in a salina near Savanna-la-Mar, and expressed a few ounces of the juice, which I subjected to the following tests.

Exp. 1. To half an ounce of the fresh-expressed juice, which was of a grass-green colour, were added two or three drops of nitrate of quicksilver, when a caseous white precipitate was instantly formed, in considerable quantity, and exhibited (to appearance, if the deduction from the experiment is right,) a much larger proportion of the muriatic acid than the cane-juice.

Exp. 2. To half an ounce of the same juice was added a few drops of the gallic acid; but this did not produce flocculence and precipitation for a long time. This acidum gallæ I procured from the rhizophora, which is very plentiful in the island, and should it assist lime in the clarification of the cane-liquor, may prove serviceable. There are many other vegetable bodies which contain it in this country, as the musa, coccoloba, &c. &c.

April 30th, 1808.—*Experiments on the juice of the Batis Maritima, continued.*

Exp. 3. The expressed juice, clarified of its mucilage, &c. by means of lime-water, by subsidence from 4 o'clock last evening to 9 o'clock this morning, was rendered of a light straw-colour. To the liquor thus depurated, one drop of the nitrate of silver produced immediate white clouds and a caseous precipitate.

Exp. 4. In the residuum of the mucilage afforded by the precipitation, the muriat of quicksilver produced no change.

Exp. 5. Gallic acid, added to the juice clarified by lime-water, precipitated the lime in the form of gallat of lime, similar to the 6th experiment on cane-juice, made on the 26th April, 1808.

There are other plants which contain not only muriatic

acid, but also sea salt. The ocymum salinum, or saline basil, noticed by Molina in his history of Chili, as related, affords half an ounce of fine salt every day.

Certain other vegetable juices, by chemical analysis, are proved to contain a variety of ingredients, besides sugar. The juice of the onion (allium cæpa) Fourcroy and Vauquelin have found to possess sulphur combined with oil, which gives it its fœtid odour; a quantity of uncrystallizable sugar; acetic acid; phosphoric acid; lime, &c. (Journal De Physique, for January, 1808, p. 98, Tome LXVI.)

The above experiments on the analysis of cane-liquor, contain, it is presumed, several important tests, or re-agents, not employed in the modern analysis of plants. Many of them are not noticed by Hermbstadt, Professor of Chemistry and Pharmacy at Berlin, in his Practical Study of Botany by means of Chemical Analysis.

Sugar is the essential salt of the cane-liquor, and bears relation to other salts, by regularly crystallizing in the form of tetrahedal prisms, terminated by dihedral summits. From the above experiments made, it would appear that the muriatic acid was chemically united with this saccharine salt, and the slip of litmus paper evinced it was not in a free or disengaged state. The re-agents have detected it, and show that this sweet salt has not so strong an attraction for it as the muriatic acid has for the lime; which, in the process of making sugar, decomposes this muriate of sugar, and precipitates in the form of muriate of lime, leaving the sugar in an uncombined state in the liquor, which, by boiling, concretes and crystallizes in the teaches, (coppers.)

It is possible all vegetable juices, containing sugar, may not require lime or alkalies to clarify them, as they may not contain the muriatic acid. This, perhaps, is the case with sugar made from the sugar maple, beets, &c.

These trials also tend to confirm the truth of the prevailing opinion of the *acid nature* of cane-juice, and why lime and alkalies are essentially necessary in the process of making sugar. The reason why lime is so very effectual in separating the mucilage, and thereby clarifying the liquor, is evidently owing to the very strong attraction or affinity it has for the muriatic acid in the liquor, which, on becoming united, leaves the sugar to granulate.

As the ship has been detained a few days longer than expected, I was induced to copy, from my diary, these experiments on cane-juice, which I amused myself with. In 1805, Mr. Ellis, a very wealthy proprietor, wrote out to his friends, requesting experiments might be tried on this subject. I have repeated the above on several estates, and am sure they are correct, provided the inferences are just from the appearances which took place. I will thank you for your opinion, and to point out other experiments to be tried, if you think these are not conclusive.

WM. M. ROSS.

Observations on the best methods of detecting POISONOUS SUBSTANCES *taken into the stomach, particularly* ARSENIC: *In a letter from* VALENTINE MOTT, M. D. *and Lecturer in Surgery, &c. at New-York, to* Dr. MITCHILL, *dated June* 1, 1810.

FROM the very general interest that was felt a few years ago in England, in the case of Miss Burns, who, it was supposed, had been destroyed by arsenic, it was thought a matter of great importance among medical men and others, that there should be something very specific laid down, in the directions given for the detection of this deleterious poison. As every case in which the opinion of a physician or surgeon is taken, at once elevates him, in the view of the law, to the solemn and important station of a judge, all eyes are intent upon him, as upon his decision rests the condemnation or the acquittal of the accused.

I heard an opinion expressed about this time, by an eminent physician, when speaking of the case above alluded to, that it was not possible to detect this poison by any set of experiments, and that the only evidence we could have which ought to justify a decision, was the effect the fluid of the stomach should have upon some living animal. As I did not agree to this declaration, though it ought to have had great weight, I was determined to institute a course of experiments, made in various ways, in order to bring the matter to an issue in my own mind; the brief result of which I have thought would not be uninter-

esting to the medical public, as thereby they will be able to have, at one view, the best means of ascertaining the presence of this poisonous material, by which the labour of reading and experimenting will be very much abridged.

I consider it, therefore, of the greatest moment, that every medical man should not only be well acquainted with the symptoms which arsenic induces, when taken into the stomach, but likewise the different experiments which are to be instituted for the detection of this poisonous oxyd, (as this is its true chemical name) when it is supposed to have been used for flagitious purposes.

The symptoms are the following; great pain and heat in the stomach and fauces, and a sense of constriction in the latter, with vomiting, and sometimes of blood; great thirst, and violent pain through the whole course of the intestines, accompanied with the most painful griping and diarrhœa; and occasionally the stools are bloody.

If it be suspected that a person has been taking this poison, it is of the greatest importance for the medical man to be very cautious, and examine with peculiar attention, before he gives his opinion, as upon it will often depend the issue of the case. Therefore, after death, when the body is to be examined, the following circumstances are to be carefully attended to. The contents not only of the stomach, but small intestines, are to be carefully collected, and the parts washed with clean water, and this water also collected. The state of the stomach is next to be attended to, and if, besides inflammation, there be one or more openings through its coats, it must not be supposed that these are proofs of the poison having been taken, as holes have been found, produced by the gastric juice, as mentioned by Hunter and Cooper.

It is better if the person, who is to examine the contents of these parts, has been somewhat in the habit of experimenting, as some address is necessary.

The contents, or washings, or both, are to be evaporated to dryness: some of the matter is then to be put upon burning coals, and if it be dissipated in white fumes, and have a smell of garlic, you are certain that the oxyd of arsenic is present. But we must not be satisfied with this alone; other proofs are to be sought for. One circumstance is to be particularly attended to, and which has been too generally misunderstood. We are told to put a little of the matter,

after evaporation, upon a hot plate, knife, or any clean metal, and upon dissipating it in vapour, you will discover a garlic smell, if any oxyd of arsenic be present. This, however, is a great and important mistake, for if it be oxyd of arsenic, no garlic smell will be evident, because by this process it is not deoxydized, and without this takes place, not the least smell of garlic will be present.

If, however, some of the same matter be thrown upon coals, it is immediately dissipated in white fumes, with a strong smell of garlic. In this last case, the oxygen is abstracted by the coals, and the evaporation of the reduced metal gives the white fumes and garlic odour. In consequence of this minute circumstance not having been attended to, or known, medical men have often been deceived.

Very lately it has been asserted that the best test is the following:* Take equal parts of the dry matter, and carbonate of potash, dissolve them in water, say 3 grains of each in 2 oz. of water, add this to 2 oz. of a solution containing 2 grains of sulphate of copper; when these are mixed, if the oxyd of arsenic be present, a green precipitate takes place, and the supernatant liquor is likewise of a green colour. This is a much more delicate experiment than any of the others, and will detect, if carefully made, the smallest portion of arsenic; it has therefore been considered perfectly decisive. It is best to dissolve, with the potash, any white powder that may remain after the evaporation, if any can be collected, in preference to any of the more impure part.

One experiment, if made, will place this matter beyond all doubt. It is the following, and more tedious than any of the others: Take a glass tube, about six inches long and three-quarters of an inch in diameter; into this put three parts of black flux, (this is the residue after the deflagration of equal parts of nitrate of potash and super-tartrite of potash) and one of the matter after evaporation. The tube, at first being closed at one end, is now to be loosely corked at the other, and put upon coals. After a very little time, if the oxyd of arsenic be present, there will be observed a coating of metallic arsenic on the inside of the tube, above the place where the composition was placed.† This, if col-

* Notes of Profeſſor Hope's Chemical Lectures.....Edinburgh, 1808--9.

† Even the ſmall quantity of a grain of the oxyd, I have found reduced to the metallic form in this experiment.

lected, and put upon a hot plate, or knife, or thrown upon coals, will burn with white fumes and flame, and emit a strong garlic smell. This found to be the case, no longer leaves the smallest doubt of the oxyd of arsenic being the cause of the death.

Another test is by taking two small smooth plates of copper; put a little of the matter to be examined in the centre, and around this place some powder of charcoal, and it is best to use a drop of oil upon the charcoal to make it adhere to the plates; then tie the plates together by means of copper wire, and place them in the fire till of a red heat; if the oxyd of arsenic be present, in a few minutes you will find, upon removing the plates and untying them, that the centre, where the matter was, will be whitish, from the arsenic having formed an alloy with the copper. This being found the case, is a complete proof of the existence of oxyd of arsenic.

If a person be not well acquainted with all these experiments, he should make a course of them upon the oxyd of arsenic, before undertaking an examination in which his decision, as before observed, will either condemn or acquit the accused.

The sulphurets, as of alkalies, have been considered by some as tests; this is, however, a mistake, as the yellowish precipitate which they occasion is by no means confined to the oxyd of arsenic; many other substances have the same effect, and we ought therefore to be on our guard, and not trust to them.

A case of VACCINA *and* VARIOLA *at one and the same time. Communicated by* TUCKER HARRIS, M. D. *of Charleston, (S. C.)*

ON Friday, Feb. 28th, 1806, I vaccinated a little negro boy, who, living at a distance, I did not see so often as might have been proper. On the 5th day after, the punctured part exhibited the usual appearance of the vaccine vesicle. This continued to progress in the common way. On Tuesday, 11th March, the 12th day after vaccination, when the areola was enlarging, I was informed that the child had been under a smart fever the preceding Sunday and Monday, viz. the 9th and 10th March; but I considered this as nothing more than a symptomatic fever, which I have some-

times, though rarely, observed to attend the vaccine disease. On Wednesday, 12th March, I took notice of an eruption on the face and extremities, which was of a suspicious appearance, resembling variola, which was then in the city. On Thursday, the 13th March, I found it to be unequivocally the small-pox. This was of the distinct kind, by no means numerous, went on in the usual way, and terminated favourably. The vaccine vesicle, in its progress, exhibited the common and usual appearances through the different stages, until the 15th March, when it began to scab over, and the small-pox at the same time were drying. Perhaps it may be questioned whether the vaccine matter I used was genuine. Of this I have not the least doubt. Because the patient from whom the vaccine fluid was taken to infect this boy was vaccinated by myself, from another who had the genuine vaccine vesicle. Here then is a case in which we see the vaccine and variolous infections acting on the same system, at one and the same time, and progressing in the usual way, to all appearance, independently and unconnected with each other. I have also undoubted authority in saying that in Charleston, one case, at least, has occurred, in which the measles and small-pox were simultaneously acting on the same system, and progressing through the usual stages, seemingly independent of each other, and terminating favourably. It appears to me unquestionable, that my patient had received the variolous infection in the natural way, about the time of vaccination. Whether the latter operation had any effect in moderating the natural small-pox or not, I cannot pretend to ascertain. This case, however, shows, as far as I can judge, that the opinion which has been held up, that vaccination may probably possess the power of rendering the contagion of small-pox, if the system be exposed to it before vaccination, ineffectual, is, in all probability, not well founded. I am further confirmed in this opinion, from the report of Dr. John Gillespie, Physician to the New-York Dispensary, published in Hex. 3, Vol. I. No. 1, p. 88, of the N. Y. Medical Repository, where he relates one case, with the usual characteristics of the true disease from vaccination, performed on the 17th January, followed on the 6th February, twenty-one days afterward, with genuine small-pox. He also gives another case, more nearly resembling that which I have narrated, in which the patient had both diseases at one and the same time. From the

foregoing cases I am induced also to believe, that the opinion, which has been advanced, that the human system cannot be affected at the same time by two distinct diseases, is not founded in truth: for we find that vaccine and variola, nay, that small-pox and measles, which last surely are two distinct disorders, have existed together in one and the same system.

Another circumstance remains to be mentioned. On Tuesday, 11th March, not suspecting any thing of a variolous infection in the case of the before-mentioned negro boy, I vaccinated a negro man with the serous effusion from the vaccine vesicle of this child. Afterwards, recollecting that his system, at the time, must have been perfectly imbued with contagion of small-pox, I felt a little uneasy, lest I should have communicated the variola to this man. On examining the puncture forty-eight hours after, I perceived a slight prominence on the part, which made me apprehensive that the infection either of variola or vaccine had taken place. This appearance, however, after a day or two, receded entirely, and for the fourth time this man resisted vaccination, though he received it at length, from a subsequent attempt.

While on this subject, I will relate the following experiment. Some years since, a patient, labouring under the eruptive fever of inoculated small-pox, was seized with convulsions and comatose symptoms to such a degree, that I thought proper, besides other means, to apply mustard cataplasms to his feet, and blisters to his legs. I wished to ascertain whether the serum of the blisters contained any variolous infection; and, accordingly, having an opportunity at the time, I inoculated a person for small-pox with some of the serous discharge from the epispastic, and applied it very plentifully to the puncture, but no disease was communicated. From this it would seem to appear, that the serum separated from the general mass of fluids, and deposited in a variolous pustule, is different from the serous effusion, occasioned by vesication, from the same mass. I will not pretend to explain this, but have mentioned the experiment as a fact.

To Dr. MITCHILL.

Charleston, May 16, 1810.

The superior advantages of cultivating HEMP, *(Cannabis Sativa) in the United States, demonstrated in various ways: In a letter from* ROBERT BOWNE, *merchant, in New-York, to* JAMES WADSWORTH, Esq. *of Genessee; dated May* 1, 1810.

AN anxious desire to call the attention of the farmers of this state to what I conceive their greatest interest, as well as the interest of the country at large, has induced me to make the following observations relative to the raising of Hemp, being fully convinced that no species of agriculture can be rendered equally productive, or tend more to increase the manufactures of the United States.

Though Hemp has for many years been cultivated in the state of New-York with considerable success, and many thousand acres of land are better adapted to its growth than for any other purpose, yet it is surprising that more general attention has not been paid towards raising a plant of such intrinsic value. Were all the farmers that have land adapted to its growth, to turn their whole attention to raise and prepare so important an article for market, they would soon make independent fortunes; and if they were under the necessity of giving double, or even treble, the usual wages paid to labourers, they ought not to be deterred from entering upon its cultivation, nor suffer one season to be lost.

As our troubles seem likely to continue, there is no knowing to what extent the price of Hemp may be carried. To every country a supply of it must be necessary; to a commercial nation in particular, it is absolutely indispensable. I am confident that nothing is wanting to stimulate our citizens to attend to its culture, but a knowledge of its vast importance, and the great benefits arising therefrom. Upon an average, three acres of good bottom land will produce a ton of Hemp, and fifty dollars will pay every expence that attends raising, water-rotting, and preparing it for market. Those who have not a natural pond, may, with a small stream of water, furnish themselves with an artificial reservoir, at a trifling expense, that will answer every purpose equally well, if not better. There is great saving, as well as certainty, in this mode of rotting, which, in the fore part of the season, is accomplished in a few days, and with the

greatest certainty. The strength of the Hemp is not endangered by this method, nor the colour or beauty of it injured, and the sooner it is rotted after being pulled, the brighter and more saleable it will appear.

The old slovenly method of rotting on the grass, has been the means of discouraging many a poor man, who, by efforts of industry, having obtained a fine crop, has, by this injudicious process, had his flattering hopes in a great measure blasted, and his labour principally lost. Moreover, when got out in this way, it is by no means equal in quality to that which is water-rotted.

A few weeks ago the writer of these observations received a sample of Hemp raised in the Genessee country, (and prepared in the manner just recommended,) which was immediately shewn to a rope-maker, who engaged all the person had that would correspond with this specimen, at four hundred dollars per ton; and declared, at the same time, it was equal to any imported that he had ever seen.

Lands suitable to the growth of Hemp abound throughout the Union. The States of New-York and Kentucky alone could produce it in quantities equal to the whole of our consumption, and at an expence not exceeding the culture of the other produce of their fields; and from its great value it can better bear the cost of transportation from those places the most remote from a market; on which account it would be particularly beneficial to the inland part of our country.

It possesses another advantage which should not be overlooked; a coloured population is not necessary to its culture. Indeed, so favourable to its production is every circumstance connected with it, that, if properly attended to, it would soon become one of our greatest articles of export; and I am fully satisfied it would be equally productive to the planter, as cotton, or any other article cultivated in the southern states.

A question naturally arises, why, if all this is true, has its cultivation not been more generally attended to? It is from the inattention of our citizens, and the dislike generally entertained by individuals to abandon their old pursuits and enter into new, without the certainty of their being much more advantageous. Should those farmers in this state who have large tracts of Hemp land, abandon every other pursuit, and turn their attention to the culture and

best method of preparing Hemp for this market, I should not be afraid to insure them independent fortunes, and greater profits than Col. Humphreys, or any other individual, will ever make by sheep; the improvement of which I am pleased to perceive so prevalent throughout the country.

Why, it may be asked, have the farmers of the United States so long neglected to pay greater attention to their breed of sheep? Nothing but the influence of some patriotic citizens has been found requisite to spread a spirit of emulation, almost enthusiasm, in many parts of the country, in respect to the Merino breed of this useful creature. I consider Col. Humphreys eminently entitled to the thanks of his countrymen, for the unwearied perseverance and zeal he has evinced in the introduction of Merinos into the United States, being firmly persuaded more lasting advantages will be reaped by the nation from his exertions, united with those of Chancellor Livingston, and other gentlemen of distinguished rank and fortune, than from millions of dollars scattered through the country.

The value of this inoffensive animal was never, before the present period, so justly estimated amongst us; nor can the efforts of individuals for the production of fine wool be too much commended. A few years will, no doubt, afford sufficient evidence of the permanent utility that will arise from the farmers improving their flocks, and that the articles of Hemp and Wool will be classed among the most important staple commodities of this country.

Though I would by no means be considered as opposed to domestic manufacture, yet I conceive it of primary importance, and more productive to the national interest, to turn the attention of our citizens, in the first place, to providing raw materials, which, in a few years, can be produced in great abundance, not only for the supply of our own manufactories, but a surplus for exportation to foreign countries, which would greatly tend to the aggrandizement of our own.

In taking a retrospective view of past events, it will be found that cotton, not many years ago, was but little known as the product of the United States. John Jay has been often abused for not making particular provision for it in the treaty with England, when, in fact, at that time, it was scarcely considered as an article of export, though it has since become one of our greatest staples; which tends fully

to prove, that when the culture of Hemp becomes equally well understood, we may reasonably presume it will be an object of still greater importance. From the strictest calculation that can be made, it will afford double the profit that cotton yields at present in our market. Large capitals, in process of time, will undoubtedly be employed for its manufacture amongst us, and no part of our country possesses more of the necessary means for entering spiritedly into its growth and manufacture, than this state. Let us then hope that our agriculturists, and patriotic fellow-citizens, may be roused from their lethargy, and that they will use every means within their power for endeavouring to produce a sufficient supply, at least, for our own consumption, which will be the means of benefiting the nation, and enriching themselves.

LETTER II.

[In this, the importance of cultivating Hemp is further enforced; and directions are given for gathering and preserving the seed.]

New-York, 7th Mo. 20th, 1810.

RESPECTED FRIEND,

THY favour of the 6th inst. per S. M. Hopkins, came safe to hand. It is very gratifying to me to find that my feeble endeavours are likely to prove of benefit to our country. The more I reflect on the subject, the stronger my convictions are, that every assertion I have made, respecting the great advantage that would result to our country at large from the cultivation of Hemp, is perfectly correct—likewise in respect to every individual who has land suitable to its growth, and that would turn his principal attention to raising and preparing it in the best manner for market. It is, indeed, an article of the first-rate importance to this country. In short, however we may boast, we are not an independent people whilst we are obliged to depend upon other countries for a commodity so indispensably necessary to our existence as a commercial nation.

Hemp is now so much wanted that many new ships, at present on the stocks, cannot be launched and sent to sea, owing to its great scarcity. My friends M. & C. expect a cargo daily; and they have no doubt but they will get five hundred dollars for every ton. Hemp of the same quality

thou gavest me a sample of, would sell for the same price readily, while that which is rotted in the grass may be bought for 400 dollars. At this last price Judge Thompson sold from four to five tons this week. Thus a shameful loss of one hundred dollars per ton! A sum that would, with good management, pay every expence of raising, water-rotting, and preparing it for market. The only reason our hemp has been in such little demand, is owing to this slovenly and destructive method of rotting it. A captain of a vessel told me, a few days ago, he would not trust a ship to go to sea with cables made of grass-rotted hemp, as there was no dependence to be placed on them. I hope the time is fast approaching when this practice will be totally abandoned, and that we shall see the hemp of this country in higher estimation than that of any other. It is really astonishing to perceive how a business of such magnitude, affording double the profit of any other species of agriculture in this country, should be so much neglected. However, the farmers are becoming sensible of its importance in every direction, and those that have land suited to its growth are preparing accordingly.

There has been an increase this season, though much more would have been sown if seed had been obtainable. I hope every attention will be paid in gathering the seed, as much will depend thereon, and its proper management afterwards. An intelligent farmer of my acquaintance informs me that he has adopted the following method of gathering his seed. In the first place he cuts his seed-hemp so soon as the seed begins to ripen, which is generally known by the appearance of the yellow-bird, which, I am told, comes in quest of it the moment when ripe. He then places a few small bundles together, and ties them at the top, to prevent their falling, and in this situation he lets them stand until quite dry. The juice in the stalk will be found sufficient to ripen the seeds that were not matured at the time of cutting. As it is impossible to prevent the seed shelling out in handling the bundles, he prepares a large sheet, made of cotton bagging, which he places on his wood-sled, that has wide shelvings fixed for the purpose. Thus equipped, he goes along-side of each bundle, tosses them into the sled, and proceeds to the threshing-floor, which he also covers with cloth of the same kind, where it is threshed out with flails. By this judicious mode I have no doubt

more seed would be saved than would pay the expence of the cloth twice over the first season.

As the seed is naturally moist and tenderly coated, great care must be taken to prevent its being heated while curing; otherwise its future vegetation may be entirely destroyed, and the labour of the cultivator perhaps totally lost. When the seed is first threshed out, and cleared of all leaves and chaff, it should be spread thin in an airy, dry place, and frequently stirred, to give it all an opportunity of seasoning; after which, as the weather grows cool, it may with safety be put in casks, or disposed of as may be most convenient.

The price of seed, for several years past, having been so high as to sell readily from five to ten dollars per bushel; it surely will amply repay the farmer for his care and attention, who must be blind to his own interest if he does not gather all he possibly can.

Every endeavour should be brought into action that will serve to stimulate or increase their exertions, else there will not be seed sufficient saved this year, for the ground prepared for sowing the ensuing season.

Much will depend upon thy efforts, united with those of other individuals, who are influential characters in your country; and I hope you will not hesitate a moment, but zealously unite in promoting this important branch of agriculture.

I remain, very respectfully,
Thy assured friend,
ROBERT BOWNE.

The Pestallozzian Plan of evolving the Faculties, described and exemplified in the School of Mr. JOSEPH NEEF,* *near Philadelphia. In a letter from Colonel* DUANE *to Dr.* MITCHILL, *dated Philadelphia, Aug.* 12, 1810.

DEAR SIR,

ABOUT a year since I gave you a sketch of Pestallozzi's system of teaching, and some account of a school upon his principles, established in this neighbourhood. I now propose giving you a more particular account of what

* For an abstract of this able instructor's method, see our Vol. XII. p. 369, 374.

I have seen in actual practice. The school, which was near Germantown, has been lately removed to a more airy and commodious position, near the falls of Schuylkill. Having determined to send a son of mine, should the institution turn out answerable to the ideas contained in the sketch published by Mr. Neef, I have, on that account, and from a conviction of the necessity of a more effectual and general diffusion of knowledge, been very attentive to the progress of this school. My little boy being now about five years and a half old, and his faculties more than usually ripe, I determined to devote a day to the most rigid scrutiny, in order to be able to determine upon the sending the boy or not. This important responsibility for the future destiny of a beloved child, you will naturally suppose was a sufficient check upon my enthusiasm; and rendered me perhaps a severe rather than a partial judge. The best method that I can devise to convey to you a correct idea of the institution altogether, will be to narrate the transactions of the day exactly as they occurred; and although this form of representation will not conform to the order in which instruction is conducted, or the mind formed to knowledge, yet as it is probably the manner in which all visitors will see the institution, I prefer it; though the improved class was that which I was introduced to first, and the youngest class last.

Our little party had spent the evening of Sunday in the country, close to the Falls, and we walked about sunrise over the curious new hanging-bridge which has been thrown across the Schuylkill; it was between five and six o'clock in the morning, and I left my friends to follow me to the school, meaning to see the whole course of the day's proceedings. My friends afterwards joined me at the school.

As I approached the place, I met Mr. Neef with his boys, about thirty in number, and from six to fourteen years old; they had been bathing in the Schuylkill, and were now returning thence. After, with characteristic good humour, expressing his surprise to see me so early abroad, and some other conversation, I told him we were come to spend a day in his neighbourhood, and if it was not inconvenient we should accompany him through the day's exercises. He appeared gratified that we had come, and observed that it was his wish that intelligent persons should strictly examine and scrutinize his principles and course of instruction;

that it was to him a great pleasure when it was tested with severity, and the more strictly the more agreeable to him. This I thought was in itself a novelty in the principles of education; as our schoolmasters generally are not very fond of being even suspected of fallibility. I determined to test both his method and his patience, and have reason to admire the latter as much as the former: he seems, indeed, as if nature had formed his mind for no other purpose than the unfolding of the human faculties. I inquired his hours of instruction, in order that I might rejoin my friends and apprize them of it; he stated that he gave four lessons a day; that is, from eight to half past nine in the morning; from half past ten to twelve at noon; from two to half past three in the afternoon; and from half past four to six in the evening.

We repaired to the school at eight o'clock, and upon a signal made by Mr. Neef, the little groups collected like bees to the hive; with cheerful faces and full of gaiety and health; they appeared as if going to a recreation rather than to a task. This circumstance was remarked by several of our company. The boys went into several rooms, the classes being so distributed, as I understand; we went into the room with the upper class, over which Mr. Neef himself presided, if it can be called presiding, where there appears no constraint or superiority. On entering the room of this class, my attention was attracted by the particular order and appearance of the room; forms and tables were placed across the room, one behind the other, in two ranges; at these the boys took their places indifferently as they came in; the direction of their eyes led mine with them to the side of the room in front of them, where I perceived, along the surface of the wainscot, a number of framed slates, upon which there appeared to be geometrical figures drawn. Above the range of slates, I perceived a large square of about three and a half or four feet, suspended from nails above, and the surface covered with paper, on which were drawn various lines, angles, and geometrical figures, sufficiently large, and neatly drawn, to be seen distinctly from all parts of the room; on another part of the same front of the room, was a large scroll, containing the letters of our written alphabet in a size large enough to be seen from all parts of the room distinctly. The boys were

all seated, and silence and order spontaneously took place of the busy hum that accompanied their entrance.

Mr. Neef now addressed us, and we took a station behind the boys, so that we could see without being seen by them; he politely informed us, that the class present had made considerable progress in their studies; that they had gone through a course, which the classes in the adjoining rooms were now pursuing; but that he would afford us at once an opportunity of forming a judgment of his method, and its effect in unfolding the faculties, which he observed was the real object of his method. "Our first lesson," said he, "will consist of two different exercises; we shall begin with an analysis of some of those geometrical figures," pointing with a small wand or verge to a tablet suspended on the wainscot; "and our second exercise shall be the attempt to draw analogous figures on our slates." You will observe that he comprehends himself in the number of the students, and in fact has contrived to impress the boys with the idea so completely, that when he commits errors, which he frequently does on purpose to be detected, and to exercise their acuteness and try their diligence, they confidently detect the errors. Mr. Neef then advanced to the front of the room, and with his verge pointed to an acute angle on the tablet, and proposed a series of questions concerning that figure, which were answered by the boys in a most interesting way, and with the utmost readiness. I expressed my surprise that lads so young, some only a little more than six, and seven, could understand these things; but he remarked that when I came to see the initiatory lessons, I would then see how they acquired that exactness and accuracy on subjects so much out of the way of boys. I also learned from him, that since his commencement, he had written down every day the exercises of the day, and that he has now two assistants, who have lately come to learn in order to teach; and that all he had to do was to put into the hands of his assistants the first lessons which he had written; and they now go on only with such instruction as he gives them in the intervals of school hours: he handed us the draft of his exercises for some weeks past, which surprised us as much by their labour as by the ingenuity and zeal they displayed in his undertaking. I requested permission to make a few extracts, which he made no difficulty of grant-

ing; and I understand he has lent his papers to several teachers, who have been attracted by the extraordinary efficacy of his method, to adopt it partially: several schools in Philadelphia have already attempted his arithmetical method, the power of which is really admirable, and yet simple. The following is a specimen of the exercise on the triangle.

" One of these two straight lines is a vertical line, the other is an oblique line.

" The vertical line is shorter than the oblique line, and the oblique line is longer than the vertical line.

" The vertical line is equal to the 7th part of one foot, and consequently to the 7th part of 12 inches.

" As the 7th part of 12 inches is equal to the 7th part of 12 wholes, and the 7th part of 12 wholes is equal to 12-7ths, the vertical line is equal to 12-7ths.

" The oblique line is equal to 3 inches, and consequently to 3 wholes.

" As 3 wholes are equal to 21-7ths, the oblique line is equal to 21-7ths.

" The vertical line being equal to 12, or to 4×3 sevenths, and the oblique line to 21 or to 7×3 sevenths, the vertical line is equal to 4-7ths of the oblique line.

" The oblique line being equal to 21 or to 7×3 sevenths, and the vertical line to 12, or to 4×3 sevenths, the oblique line is equal to 7-4ths of the vertical line.

" The vertical line meets the oblique line in one point.

" The oblique line meets the vertical line in one point.

" These two straight lines meet each other in one point.

" The final point of the vertical line coincides with the final point of the oblique line.

" The final point of the oblique line coincides with the final point of the vertical line.

" These two meeting lines comprehend a space which is called an angle.

" As this angle is formed by lines, it is said to be a linear angle.

" This angle is said to be a linear angle because it is formed by lines.

" This linear angle is formed by straight lines.

" As this linear angle is formed by straight lines, it is said to be a rectilinear angle.

" This linear angle is said to be a rectilinear angle because it is formed by straight lines.

" The straight lines which form this rectilinear angle are called the limbs of this rectilinear angle.

" This rectilinear angle is formed by two straight lines, and has consequently two limbs.

" One of the two limbs of this rectilinear angle is a vertical line, the other is an oblique line.

" The vertical line is the vertical limb of this rectilinear angle.

" The oblique line is the oblique limb of that rectilinear angle.

" The point in which the two limbs of this rectilinear angle meet, is called the summit of that rectilinear angle.

" The oblique limb of this rectilinear angle ascends from the left to the right, and descends from the right to the left.

" The oblique limb of this rectilinear angle, considered from its initial point, inclines to the left, and, considered from its final point, inclines to the right.

" The limbs of this rectilinear angle incline towards each other.

" As the limbs of this rectilinear angle incline towards each other, they are not perpendicular to each other.

" As the limbs of this rectilinear angle are not perpendicular to each other, it is not a right angle.

" This rectilinear angle is not a right angle, because its limbs are not perpendicular to each other.

" As this rectilinear angle is not a right angle, it is said to be an oblique angle.

" This rectilinear angle is said to be an oblique angle, because it is not a right angle.

" This oblique angle is smaller than a right angle.

" As this oblique angle is smaller than a right angle, it is said to be an acute angle.

" This oblique angle is said to be an acute angle, because it is smaller than a right angle.

" The initial point of the vertical limb, and the initial point of the oblique limb, are not equi-distant from the summit of that angle."

Two difficulties occurred to me during this analysis, and the analysis of two more angles which followed; and I freely suggested them: the first was, that there were se-

veral terms employed, and certain modes of expression, which boys of six, seven, or eight years old, could not be acquainted with. Mr. Neef, in the kindest manner, removed this difficulty most satisfactorily. "You will observe," said he, "that we are not mere beginners in this class; we have already travelled over much ground; and could not possibly have reached this point if we had not secured every step up to it. In our two junior classes you will find other tables, by which we acquire a full knowledge of horizontal, vertical, and oblique lines, of right angles, squares, rectangles, &c. &c. What we learned in the preceding stages, is now only occasionally taken notice of, but it is always subordinate to the exercises in hand; as we know all the properties of lines before these exercises, we make use of our knowledge, it being no longer necessary to explain what a line is, since we already know its properties; we only apply the knowledge of its properties, previously acquired, to new means of enlarging our knowledge, as in these formations of angles." I then urged that they all repeated this exercise together, and as if by rote, that I was not satisfied that they understood all that they had said. He smiled archly, and replied, "You shall see; judge for yourself."

Each boy now took a slate from the hook upon which it was suspended, and resumed his place: slate-pencils were also in hand; and Mr. Neef took his station again, and begun in this manner:

"Come, boys, we must now see whether we understand what we have been saying. Construct an acute angle with a horizontal and an oblique line; make the horizontal line equal to 8 inches, and the oblique line equal to 5-7ths of the horizontal line; make the initial point of the horizontal line coincide with the final point of the oblique limb."

This angle was formed under the direction of a little fellow of about seven years old, who was called upon by Mr. Neef to describe what he had done; and he did describe it in a manner truly admirable, and a precision truly geometrical. He spoke thus, Mr. Neef remaining silent:

Scholar—"Six inches below the superior piece of the frame of my slate, I draw a horizontal line, and make its length equal to 8 inches."

The rest of the class all repeated the same words which he had expressed, and each performed with his pencil on

his slate the operation described: The little fellow proceeded—

Scholar—"I divide my horizontal line by 6 points into 7 equal parts."

This was repeated and performed by the whole class as before; and he went on thus:

Scholar—"Vertically above the fourth dividing point of my horizontal line, I mark a point which shall be at the distance of 5-7ths of my horizontal line from the initial point of my horizontal line."

The class expressed and performed the same operations; the figures being drawn, I examined them by passing along the benches behind, and was surprised to find the lines drawn by the hand through the whole class, as true as if they had been drawn with a rule, and as exact to the length as if measured with a compass, which I afterwards found he has been accustomed to introduce to test their accuracy. The angle being drawn, Mr. Neef put a series of questions to the boys promiscuously, one at a time, such as, why do you call this an acute angle? Why do you call it an oblique angle? Why is it not a right angle? Why do you say its limbs are not perpendicular? &c. analogous to the principles of the previous exercise; and I was very soon satisfied that they not only understood what they said, but were much more competent to define the properties of the angle than I was myself. Mr. Neef now introduced what he calls in his sketch, p. 45, his *supreme judges;* that is, a pair of compasses and a ruler; and having put all the drawings on the slates to their trial, with a most minute particularity, but always with a cheerful and jocose manner; the boys appeared to be zealous to excel each other in accuracy in every particular.

He then resumed his station, and said, Let us now construct a square. Another boy, about eight years old, was called upon; and it is a part of his system not to call on the same boys to execute the same things, but to take them all in turn, but not in any arbitrary order; so that, as the boy is not prepared, and as the questions, generally, are invented at the moment in the teacher's mind, there can never be any doubt as to the understanding of the subject strictly by the pupil. He thus begun: "Construct a square; make its perimeter equal to 28 inches; divide its base into

5 equal parts; on 4-5ths of its base construct a rectangle; and make its height equal to 3-10ths of its perimeter."

This intricate problem did not disconcert the little fellow; it was obvious, that without ascertaining the base or some side of the square, and the height of the rectangle, he could not proceed; so he began by determining these points in a most ingenious manner, and with a power of reasoning truly interesting.

Scholar—" The perimeter of the square is equal to 28 inches; its base being equal to the 4th part of its perimeter, is equal to the 4th part of 28, and consequently to 7 inches; on 4-5ths of its base is to be constructed a rectangle, whose height is to be equal to 3-10ths of its perimeter. Its perimeter may therefore be considered as having 10 equal parts, whereof its height comprehends 3 parts. Its semi-perimeter, composed of its height and its base, is equal to the half part of its perimeter, and comprehends consequently the half of ten, or 5 parts of its perimeter; but since its height comprehends 3 of its perimeter, or 3 out of ten parts, its base or its semi-perimeter, less its height, comprehends, 5 less 3, or only 2 of its perimeter of 10 equal parts. Its height comprehending 3, and its base 2, of its perimeter of 10 equal parts; its height is equal to 3-2 of its base."

This course of reasoning was expressed from the operation of the mind distinctly, and without hesitation or difficulty; and having thus determined, by strict reasoning, the base as well as the height of the rectangle, the little geometrician began to construct his figure, and to express the operations, which he successively performed with his pencil. All the other boys of the class repeated what he said, after he had done; and executed the same drawing.

Scholar—" I draw a horizontal line, and make it equal to 7 inches." The class repeats.

" From the initial point of my horizontal line, I draw a vertical line, and make it equal and perpendicular to my horizontal line.

" From the final point of my horizontal line, I draw my second vertical line, and make it equal and parallel to my first vertical line.

" From the final point of my first vertical line, I draw my second horizontal line, and make it equal and parallel to my first horizontal line.

"I divide each base of my square by 4 points, into 5 equal parts.

"From the first dividing point of the superior base of my square I draw a vertical line, and make it equal to 6-5ths of the superior base of my square.

"I prolong the right vertical side of my square by one fifth.

"From the final point of my last vertical line, I draw a horizontal line to the final point of the prolonged right vertical side of my square."

This process was performed off hand, and a number of questions were then proposed to several of the class, indiscriminately, concerning the areas, the sides, the relations which the two figures bore to each other. The figures were then examined, and their accuracy tested by the *impartial judges*, the compasses, and found, what would seem to one who had not seen it executed, incredibly accurate. This course terminated the morning lesson, and the boys were dismissed. The ground is spacious and airy, and care is taken to give an unperceived direction to their pleasures; botany, mineralogy, agricultural facts, are brought into their view as mere accidents; the knowledge of distances by the eye and pace; the knowledge of the character of trees by their shape, elevation, bark, and leaves; and so of other natural objects, which accumulate the stock of facts, and make utility pleasure. My friends and Mr. Neef walked a while around the ground, and conversed on various subjects: there appears to be no bounds to his information, and it is all exact; nothing given as fact which you cannot rely upon.

At half past ten the signal was given, and, true to the moment, they were all soon seated. Mr. Neef explained to us again the two new exercises which were now to be performed for the second lesson of the day. The first was a fractional calculation, which they performed by means of one of those large suspended tablets, containing 100 square spaces, in ten rows, which, by succession, represent whole numbers, halves, thirds, fourths, &c. The number taken up at first was 4 + 1-5th.

Mr. Neef asking successively of which number it was 21-22ds, 21-23ds, 21-24ths, 7-8ths, 21-25ths, as 21-50ths.

The questions were answered by the class altogether; and they uniformly added their reasons shewing the cor-

rectness of their answers. They managed these subjects in this style:

Teacher—" 4—1-5th = 21-22ds *x*.—or in words—four *more* one fifth are equal to twenty one times the twenty second part of *what number*. (The *x* is put as the sign of the question what number.)

Scholars—Four more one fifth are equal to 21 times the 22d part of 4 more 2-5ths.

Teacher—" Why?

Scholars—" Four more one fifth are equal to 21 times 1-5th; 21 times 1-5th are equal to 21 times the 22d part of 22 times one fifth; 22 times one fifth are equal to 22-5ths, and 22-5ths are equal to 4 + 2-5ths.

Teacher—4 + 1-5th = 21 times the 23d part of what number.

Scholars—4 + 1-5th = 21 times the 23d part of 4 + 3-5ths.

Teacher—Why?

Scholars—4 + 1-5th = 21 × 1-5th; 21 × 1-5th = $\frac{21}{23} \times \frac{23}{1} \times \frac{1}{5}$; $\frac{23}{1} \times \frac{1}{5} = \frac{23}{5}$, and 23-5ths = to 4 + 3-5ths.

Teacher—4 + 1-5th = to 7-8ths of what number?

Scholars—4 + 1-5th = to 7-8ths of 4 — 4-5ths.

Teacher—Why?

Scholars—4 + 1-5th=21-5ths; 21-5ths=to 7 × 3-5ths; 7 × 3-5ths = 7 times the 8th part of 8 times 3-5ths; 8 × 3-5th = 24-5ths, & 24-5ths = 4 + 4-5ths.

These calculating operations must no doubt appear abstruse even to some hundreds of those who undertake the duties of instruction; but to the boys of seven and eight years old at Neef's school, appear neither difficult nor perplexing; indeed it is mere play to them, because they see what they say, and say nothing that they do not both see and understand. Do not mistake me, by supposing that it is written down for them; the little boys who manage these calculations, are yet to learn not only to write, but to read; they understand these things before they learn the alphabet; they learn to draw lines of all shapes and dimensions, and writing comes easy to them after knowing the properties of lines. What I mean by saying *they see what they say*, refers to the relations which the different numbers bear to each other, as they stand in the table of 100 squares, which I have before noticed. This table shews them in the most luminous way, that a space of any given dimensions, say

one inch may be divided into two, three, or any other number of parts, and that all these parts are still comprehended in the original space; that these parts of the space are fractions of that space, and that the several spaces bear a relation to the analogous quantities. Thus they look at their table and find that 4 are 5 times the 9th part of 7 more 1-5th; and that 7 + 1-5th are equal to 9-2ds of one more 3-5ths, and so on to any relation of numbers or fractions.

This exercise being over, a number of questions analogous thereto, and to preceding lessons, were proposed to each boy, promiscuously and individually. Another little boy of seven years old was asked this question: 3 + 1-3d = twice the 9th part of how many times 7-4ths? After a few seconds reflection he answered, three more one third equal to twice the ninth part of nine times seven fourths, less three sevenths of seven fourths; and when required to shew that his statement was accurate, he went instantly into this train of reasoning:

Scholar—"Three, more one third, are equal to ten thirds; ten thirds are equal to twice five thirds; twice five thirds are equal to twice the 9th part of 9 × 5 thirds; 9 × 5 thirds are equal to 45-3ds; 45-3ds are equal to 15; 15 are equal to 60-4ths; and 60-4ths are equal to $9 \times \frac{7}{4}$, less 3-7ths of 7 fourths."

Another boy was asked the following question:

Teacher—"If a man in 8 days earns 28 dollars, in how many days will he earn 91 dollars?" The question was no sooner uttered, than the boy began his answer that he would earn 91 dollars in 28 days; and being asked to demonstrate it, the young arithmetician began thus:

"26 dollars are to 91 dollars, as the time in which the man in question earns 26 dollars is to the time in which he is required to earn 91 dollars; we have therefore the proportion as 26 is to 91, so is 8 to what number, or 26 : 91 :: 8 : x; but 26 is to $\frac{7}{4} \times 26$, as 8 is to 7 times the half part of 8; the half part of 8 being 4; 7 times the half part of 8 is 7 times 4, and 7 × 4 = 28; a man supposed to earn 26 dollars in 8 days, will therefore, by the same proportion, earn 91 dollars in 28 days."

Various questions of this description being put successively to one or other of the class, indiscriminately, were solved with the utmost facility and perspicuity. Mr. Neef then reminded me of the first part of his sketch of edu-

cation, of which we had spoken in the morning, which was an exercise calculated to unfold the powers of observing, analyzing and describing natural objects. The first branch of Neef's sketch, I believe, is divided into eleven sections; the fourth of which relates to the different parts of the object; this exercise they performed in this manner:

Teacher—" What is the situation of your right thoracic limb?"

Scholar—" My right thoracic limb is attached to the right side of my thorax, or breast; it extends from my right shoulder to the extremities of the fingers of my right hand, and hangs down the right side of my torsal, or body."

Teacher—" What is the situation of the iris of your left eye?"

Scholar—" The iris of my left eye is situate within the cornea of the ball of my left eye; it surrounds the pupil, and is encompassed by the white of my left eye."

Teacher—" What is the situation of your teeth?"

Scholar—" My teeth stand in their sockets, along the edges of my jaws; they form two equal horizontal arches, running parallel to each other."

Teacher—" What is the situation of my forehead?"

Scholar—" Your forehead is between the upper parts of the sides of your head, and is terminated at each end by your temples; above, it borders on the fore part of the crown of your head; below, it is bounded by the root of your nose and your eye-brows."

Teacher—" What is the situation of your right superior grinders?"

Scholar—" My right superior grinders occupy the right side of the upper part of my mouth; they stand in their sockets, and extend from my right superior eye-tooth, to the right extremity of my upper jaw."

This description of questions embraces the whole system; the answers are not sought of any particular boy, but intermediately and alternately of every one; sometimes the answers are given by one boy, some times all are required to answer. These exercises brought us to dinner-time, and we were all invited to dine; but there being ten or twelve of both sexes of our party, we had made arrangements for dinner at an excellent tavern near the place, to which we adjourned, very much delighted, and indeed

astonished at what we had seen and heard. We made an early dinner, in order to be prepared to meet the little beehive of philosophers at their hour of assemblage; and reascended the hill in time to have a little conversation before the hour.

Mr. Neef then conducted us into the junior class rooms, and pointed out to us the tables from which the first rudiments of forms and exact ideas are taught, and the nature of the operations, which surprise as much by their simplicity as the effects which we have seen produced by them; they are, indeed, so simple, that, like the story of Columbus and the egg, it seems only surprising how no one ever thought of the like before.

About two o'clock, the signal being given, the rooms were soon occupied with the usual gaiety of boys going to a delightful sport. The exercise in Mr. Neef's class began with a square exhibited on one of the tablets suspended against the wall. This square was divided into five rectangles by vertical lines, the areas of which were determined to be equal to as many square inches: this being premised, he commenced in this way:

Teacher—"The rectangle, composed of the first, and the second fifth of the 7th square in the fifth row, has its height equal to 4 inches, and its base is equal to the 7th part of its perimeter, how many square inches is its area equal to?"

Scholars—"The rectangle, composed of the first and the second fifth of the 7th square in the 5th row, whose height is equal to 4 inches, and whose base is equal to the seventh part of its perimeter, has its area equal to 6 square inches, more twice the fifth part of one square inch."

Teacher—"How do you discover this?"

Scholars—"The rectangle in question has its height equal to 4 inches, and consequently to 4 wholes, and since its base is equal to the seventh part of its perimeter, its perimeter may be considered as having seven equal parts, whereof its base, or one of its two horizontal sides, comprehends one. Its two horizontal sides consequently comprehend 2 × 1, or two of the seven equal parts of which its perimeter is composed; and as its two vertical sides are equal to its perimeter, less its two horizontal sides, its two vertical sides comprehend 7 less 2 (7—2) or 5 of the seven equal parts of its perimeter. Its two horizontal sides

comprehending 2, and its 2 vertical sides comprehending 5 of the seven equal parts of the perimeter, its 2 horizontal sides are equal to twice the fifth part of its two vertical sides; and because its base is to its height as its 2 horizontal sides are to its two vertical sides, its base is equal to two times the fifth part of its height, and consequently to twice the 5th part of 4 wholes; and as twice the 5th part of 4 wholes, is equal to twice four fifths, or to 8-5ths, its base is equal to eight fifths. Its height being equal to 4 wholes, and its base to eight fifths, its area is equal to 4 times 8, or to 32 fifths; and since 32-5ths are equal to six wholes, more twice the fifth part of one whole, the rectangle composed of the first, and the second fifth of the seventh square in the fifth row, has its area equal to 6 square inches, more twice the fifth part of one square inch."

Here is a series of reasonings, or progressive inductions from facts, that would seem profound enough for any of our grave professors; but it is impossible, without being present, to conceive the ease and readiness with which this, and numerous other questions equally abstract, are resolved and defined; all conducted with the same accuracy of reasonings, analogous to the known quantities of the several questions. At last they determined the relation existing between the different rectangles and the square; of these I shall give you only one specimen; the question was addressed to a child of about seven years old.

Teacher—" If you divide the base of a square, whose perimeter is equal to 28 inches, into three equal parts, and on 2-3ds of its base you construct a rectangle, making its height equal to 6 times the 19th part of its perimeter, how will the area of the rectangle be to the area of the square?"

After about two minutes reflection, the child thus expressed himself:

Scholar—" If I divide the base of a square, whose perimeter is equal to 28 inches, into three equal parts; if on two thirds of its base I construct a rectangle, and make its height equal to 6-19ths of its perimeter, its area will be equal to 16-21 of the area of the square."

Teacher—" How do you make that out?"

Scholar—" The perimeter of the square in question is equal to 28 inches. Its base is equal to the 4th part of its perimeter, and consequently to the 4th part of 28 inches, or to 7 inches: Its base being equal to 7 inches, its area is

equal to 7 × 7, or 49 square inches; and since 49 square inches are equal to 49 wholes, and 49 wholes are equal to 147-3ds, its area is equal to one hundred and forty-seven thirds. On 2-3ds of its base I construct a rectangle, and make its height equal to 6-19ths of its perimeter. The rectangle being constructed on 2-3ds of the base of the square, has its base equal to 2-3ds of the base of the square, and consequently to 2-3ds of 7 inches; and since 2-3ds of 7 inches are equal to 2-3ds of 7 wholes, and 2-3ds of 7 wholes are equal to 2 × 7-3ds, or to 14-3ds, its base is equal to fourteen thirds: but as its height is equal to 6-19ths of its perimeter, its perimeter may be considered as having 19 equal parts, whereof its height, or one of its two vertical sides, comprehends 6; its two vertical sides consequently comprehend 2 × 6, or 12 of the 19 equal parts composing its perimeter; and as its horizontal sides are equal to its perimeter, less its two vertical sides; its two horizontal sides comprehend 19 less 12, or 7 of its perimeter's 19 equal parts. Its two vertical sides comprehending 12, and its two horizontal sides 7 of its perimeter's 19 equal parts, its two vertical sides are equal to 12-7ths of its two horizontal sides; and because its height is to its base as its two vertical sides are to its two horizontal sides, its height is equal to 12-7ths of its base, and consequently to $\frac{12}{7}$ × 14-3ds, or to 24-3ds; and as 24-3ds are equal to 8 wholes, and its base to 14-3ds, its area is equal to 8 × 14, or 16 × 7-3ds, and the area of the square to 147-3ds, or to 21 × 7-3ds; the area of the rectangle is equal to 16-21 of the area of the square."

I need offer you no observations on the system of instruction, which can enable a boy of seven years old, who has not learned either to read or to write, to embrace and comprehend, and to pursue, through such a maze of reasoning, a question such as this. But I have now to apprize you that they have begun to write: write, do I call it! I know not what term sufficiently comprehensive to give; and am equally at a loss which most to admire, the analytical skill of the teacher, or the sagacious proficiency of the pupils. They learn to write and think, and understand what they do, at once. I wish I could say as much of some of the greatest universities in the world. I mentioned to you that the written alphabet was placed on a scroll in front of the boys. They had undergone, it seems,

a course of analytical examination on several of these letters, and are now to go through an exercise on the letter o, as I understood it. He began by apprizing them, as usual, that he was about to begin to analyse the sounds of our language; and he then expressed the sound *pop*—and then asked,

Teacher—" How many sounds have you heard?"

Scholar—" I have heard one sound."

Teacher—" What kind of sound is the sound *pop*?"

Scholar—" The sound *pop* is an articulate sound."

Teacher—" Why do you call the sound pop an articulate sound?"

Scholar—" The sound *pop* is called an articulate sound because it is composed of the sound o, (o representing the sound which we perceive in the words top, pop, prop, drop) and two articulations."

Teacher—" How many elements has the sound *pop*?"

Scholar—" The sound *pop* has three elements."

Teacher—" Which is the first element you perceive in the sound *pop*?"

Scholar—" The first element perceived in the sound *pop*, is an articulation."

Teacher—" What kind of articulation?"

Scholar—" The first element we perceive in the sound *pop*, is a labial articulation."

Teacher—" Why do you call it a labial articulation?"

Scholar—" I call the first element we perceive in the sound *pop* a labial articulation, because it is effected by a motion of my lips."

Teacher—" Which is the second element you perceive in the sound *pop*?"

Scholar—" The second element we perceive in the sound *pop* is the sound *o*."

Teacher—" What kind of sound is the sound *o*?"

Scholar—" The sound *o* is an inarticulate sound."

Teacher—" Why do you call the sound *o* an inarticulate sound?"

Scholar—" Because it is not accompanied by any articulation."

Teacher—" Which is the third element you perceive in the sound *pop*?"

Scholar—" The third element we perceive in the sound *pop* is an articulation."

Teacher—" What kind of articulation?"

Scholar—" The third element we perceive in the sound *pop* is a labial articulation."

Teacher—" Why do you call it a labial articulation?"

Scholar—" Because it is effected by a motion of the lips."

Teacher—" By how many letters will you represent the sound *pop?*"

Scholar—" By three."

Teacher—" Why?"

Scholar—" Because it has three elements."

Teacher—" By what letter will you represent the first element of the sound *pop?*"

Scholar—" By the letter *p.*"

Teacher—" Why?"

Scholar—" Because the first element of the sound *pop* is a labial articulation, and this labial articulation is represented by the letter *p.*"

Teacher—" By what letter will you represent the second element of the sound *pop?*"

Scholar—By the letter *o.*"

Teacher—" Why?"

Scholar—" Because the second element of the sound pop is an inarticulate sound, and that inarticulate sound is represented by the letter *o.*"

Teacher—" By what letter will you represent the last element of the sound *pop?*"

Scholar—" By the letter *p.*"

Teacher—" Why?"

Scholar—" Because the last element of the sound *pop* is a labial articulation, which is represented by the letter *p.*"

Teacher—" Well, now represent the sound *pop* in writing."

Scholar—" I represent the sound *pop* by the letter *p*, the letter *o*, and the letter *p.*"

They then write these letters on their slates. They were then questioned in various modes to give an account of what they had done, and to state the reasons for proceeding in any given manner. Another sound was then taken up, and treated in the same way; and so they went on for about three quarters of an hour, which is about the usual time apportioned to any particular exercise. Mr. Neef then examined their slates, and pointed out defects in the forms of letters, and put a few questions to try the capacity

of those who were either very slow or very quick in learning; always with cheerfulness, and no sort of constraint but such as arises from their own sense of obligation to the teacher. The slates were then put up, and pencils laid apart, and the class dismissed.

I was here at a loss again to conceive how it was possible for boys, so young as these I had just seen, to give all those ready and accurate answers. The getting of lessons by rote, and repeating them as is practised at our schools and colleges, was not a method capable of producing knowledge so accurate, nor explanations so instructive and satisfactory. The age of the boys, and every thing I saw, rendered the matter to me more surprising; and I did not hesitate to express the thoughts which had passed through my mind. Like his pupils, he did not hesitate to explain these difficulties away, perfectly to my satisfaction. I think I can follow the train of his observations. This mystery, like the rest, will disappear, said he, when you know that the lessons you have seen to-day are the result of ten weeks occasional application to this subject; during that time, once every day, we have been discussing in different exercises, all that relates to speaking and thinking; ideas and their formation were our first topics; and we found that we communicated ideas to each other by sounds; that these sounds were produced by our vocal organ, the nature of which we therefore investigated; we examined the different parts of which it is composed, and determined in how many different ways the sounds of our language are modified; distinguished their different articulations, ascertained the number of single and double inarticulate sounds; and it was not until they were fully acquainted with these particulars that I apprized them of the possibility of representing our oral sounds and articulations to the eye, by means of signs; it was at this stage requisite to guard them against confounding signs with things, and make them sensible of the difference between a natural and an artificial representation of a thing, and convince them that it was impossible to represent sounds by natural signs; and of course they could only be represented by artificial signs. It was then I came forward with my alphabetical table, which you saw on the scroll, and informed them that such a letter was used to represent such a sound or articulation. By these previous exercises they were enabled to understand my

questions, and to answer them with that readiness and accuracy which has surprised you.

The explanation was indeed satisfactory, but the labour and attention bestowed on their instruction, excited equal admiration; and I could not but remark that this course, pursued up to the stage of a complete knowledge of the language, would require a long course of years, and great difficulties to be overcome. He replied, with some gaiety, that the length of time was not so great as it would appear at first; that the greatest difficulty of all was the utter absurdity of the alphabetical system, and yet these absurdities it must be necessary to learn, in order to know what is, as well as what is not conformable, to established principles. I then inquired if it was his intention to undertake the immense task of teaching them to spell every word in the language. This business will lose half its terrors before method, said he; I shall divide them, in order to overcome them, into three sections. The first shall consist of all the sounds and articulations of our language, in a way which, however irregular it must necessarily be from the imperfection of the alphabet, I will call *regular*. The second section will comprehend all those words in which the sounds are represented *irregularly*. The third shall comprehend all the irregular representations of the consonants. It will be an immense task for you. That I cannot help, said he, and of course, having engaged in it, must make a virtue of necessity; if we had a rational alphabet, my boys would, in three weeks, be able to read and write; but with the monstrous system we have got, two years labour will be little enough; but we shall do great things of other kinds at the same time. Many other observations and inquiries which I made, have escaped me. After walking sometime the signal was made, and the little flock crowded to their philosophical pastime; where my friends and I again joined them.

This last lesson of the day again comprehended two exercises: calculation was the first, and music the second. The lesson in calculation was analogous to that of the forenoon, and was concluded as usual by a series of questions proposed to and solved by each boy individually. A single example of those questions and solutions will enable you to judge of the comprehensiveness of mind and rea-

soning powers of those astonishing little fellows. He put the following question:

If a traveller, starting at six o'clock from Philadelphia for Harrisburg, walks eleven miles in four hours; and a second traveller, taking the same road, starts from the same place at ten o'clock, walks thirteen miles in four hours, how many miles will the second traveller be obliged to walk before he overtakes the first?

This question was put to a boy of about eight or nine years old, who did not hesitate an instant to answer, that the second traveller would be obliged to walk 71 miles and a half before he should overtake the first. Being required to shew the correctness of his answer, he argued in this way, off hand:

The first traveller starts at six, the second at ten; consequently the first has four hours ahead of him, in which time he walks eleven miles, which the second must necessarily gain upon him in order to join him. But as the first walks eleven, and the second thirteen miles in four hours, it is clear that the second traveller gains every four hours two miles upon the first. If then the second gains two miles upon the first every four hours, the question arises, in how many hours he will gain eleven miles upon the first. This we shall find by the following proposition: Two miles are to eleven as the hours in which he gains two miles are to the hours in which he will gain eleven miles; but two is to eleven times the half part of two, as four is to eleven times the half part of four; and eleven times the half part of four is twenty-two; he will consequently gain those eleven miles in twenty-two hours; but as he walks thirteen miles in four hours, how many miles will he walk in twenty-two hours? This we shall find by the following proposition: Four hours are to twenty-two hours as the miles he walks in four hours are to the miles he walks in twenty-two hours; but four is to eleven times the half part of four, as thirteen is to eleven times the half part of thirteen; and since 11 × 13-2ds = 143-2ds; and 143-2ds = 71 + 1-2, it is clear that the second traveller will have to walk 71 1-2 miles before he joins the first.

An exercise on the principles of music, concluded the day's exercise. It was managed in this way: Mr. Neef, as customary with him in other exercises, called upon one

of his boys to lead; and now to perform the functions of *precentor* or leader of the band; and said, let us take five tones, making the first tone lower than the second, the second lower than the third, and the third higher than the fourth, and the fourth higher than the fifth; let the intervals between every two tones be equal to one degree: So much for the elevation of the tones: as to their duration, let us take triple time. Each of the four first tones shall be equal to 3; the last only to 2; after the last tone there will be a rest equal to 1.

The *precentor* now began to beat time, sing the five tones beginning and ending in C. The whole class repeated his tones. The leader then sung five tones, beginning and ending in D, and the class repeated as before: the next tones began and ended in E, and so they went on as far as the octave C.

Mr. Neef then directed the leader to descend from the octave of E, and to invert the elevation of the tones. This was executed with all possible accuracy. The duration of the tones was then changed to various lengths; and at last some inquiries were made concerning the difference between two tones; and some problems were solved to illustrate the subject, whereof the following will give you some idea.

Teacher—" In what manner may two tones differ?"

Scholar—" Two tones may differ in elevation."

Teacher—" Sing two tones, the first of which shall be lower than the second."

" Sing two tones, the first of which shall be higher than the second."

" Sing two tones, the first of which shall be two degrees higher than the second."

" What other differences do you remark between two tones?"

Scholar—" Two tones may differ in duration or length."

Teacher—" Sing two tones, and make the first longer than the second."

" Sing two tones, and make the first equal to twice the second."

" Sing two tones, but make the second equal to a third part of the first."

These exercises being all closed, the class was dismissed, only with a call upon him to go with them to bathe; which

he promised; and we saw him and his two assistants afterwards engaged in teaching the young philosophers to swim.

I need not tell you that I sent my son to this place for his education, and that I already enjoy the satisfaction, only after two or three weeks, to find my little boy collecting ideas, discarding the little trifling ideas of the nursery, and climbing up to a competition with little fellows of the same age in exact thinking.

You will excuse the length of this letter on account of the subject, and its vast importance to society. It is, I think, desirable that every intelligent man in the country should know what can be done. Mr. Neef has got two volunteer assistants, who were struck with the perusal of his sketch in Ohio, and have come hither to be his disciples: he has boys between six and ten from different parts of the continent; from Virginia, Boston, New-York, Washington, &c.

I am,
Dear Sir,
With respect and regard,
Your obedient servant,
WM. DUANE.

Cursory Observations and Remarks on the ANTIQUITIES *of Georgia. Addressed to the Editors by Dr.* NICHOLAS CHILDERS, *of Baldwin County, (Georgia,) in a communication dated June,* 1810.

VARIOUS circumstances combine to render a knowledge of our geological history desirable. Much difference of opinion having existed among the inhabitants of every country, and in every age, respecting the antiquity of the planet we inhabit, it becomes an object of rational curiosity to inquire into the subject with patience and impartiality. In order to this, we must suffer ourselves to be governed by those data, imprinted by the hand of nature on the objects which surround us, as well as by those with which the industry of man has presented us, in the recesses of the forest. These are faithful monuments, unbiassed by the rivalship of authors; untarnished by the conflicting interests of ambitious man.

I have long dwelt in silence on this interesting subject, in the hope, that some person competent to render it ample justice might take up the pen; but in this I have been disappointed, and consequently enter upon the duty "with all my imperfections on my head," in the hope of rescuing from oblivion those unequivocal traits of the remote civilization of this "new country."

The forests of America are rich in the remains of ancient industry and art. Kentucky, Ohio, New-York, and Virginia, with many other places, have severally presented to the eye of curiosity, a splendid scene for contemplation; and it is the province of this feeble attempt to shew, that Georgia herself can also furnish her full quota to this collection of useful knowledge.

The State of Georgia may be naturally divided into the upper and lower countries. The lower country extends from the sea-coast many miles on an almost uninterrupted plain, intersected with numerous morasses indicative of its former submersion in the waters of the Atlantic. The upper country extends from this level tract, interspersed with hills, valleys and rivulets, until it intersects the main ledge of mountains which divide the eastern from the western waters. On the last portion of this country I shall bestow the subsequent observations.

There is, near the dividing line between the broken and level portions of this State, an extensive ledge of marine productions, as oyster-shells, &c.; and this ledge reaches quite across the State, on a direction nearly parallel to the sea-coast. This immense depository of marine substances, although in a state of considerable decay, as it respects their organization, forms a fund of lime for building, &c. which is obtained by the usual process of digging and calcination. Plaisterers, however, allege, that it has not that consistence and purity necessary to the most perfect workmanship. Thus much I have premised concerning this bed of marine substances, expecting to derive some collateral aid from it in the investigation of the subject before me.

A few miles above this "limestone tract," (as it is generally termed,) commence those traits of ancient habitations, and evidences of former civilization, which I am about to describe. The first of these, which I saw, is on the Oakmulgee river, near the site on which stands Fort Hawkins; here are two *tumuli*, or mounds, of considerable

magnitude. The one which I ascended I should judge, (for I did not measure it,) to be not less than 20 feet in perpendicular height, and 150 feet in circumference at its base; and has every appearance of having been the workmanship of some civilized nation. It is situated on the plain extending from the river, which runs at the distance of a quarter of a mile from the mound: there is around it no appearance of hills, or natural irregularities on the surface of the earth, which could induce the slightest suspicion of its being natural. It is in shape a regular cone, with its apex a little flattened, (perhaps from frequent ablution,) and on its summit, as well as sides, grow trees of as large size as any in the adjoining forest; they are of different kinds, as oak, hickory, &c. There is another mound, of the same shape and description, a few hundred paces distant from the first, but of a less dimension, near which stands the public store-house. I regret not having it in my power to examine the interior of these mounds, (or barrows) as I am informed their contents are very interesting. In digging into the side of one of them, in order to fix some building belonging to the garrison, (perhaps the magazine,) they found several mutilated remains of guns, the plates of whose locks were much longer than those now in use, and appeared to have had their "works" on the outside. There have been found also, at or near this place, some remains of farming utensils, as axes and hoes, of a form very different from those of modern times: these have been found in considerable numbers. Added to these, and of much more importance, there has been found here the clapper of a bell, which, after a lapse of time to us unknown, and after undergoing, during this immense length of time, the influence of oxydizement, now weighs seven pounds. This I have not seen, but am credibly informed it is in the possession of a Mr. Miller of Jones county. At or near the same place has been found a brass medal, with some obscure hieroglyphic figures on it; and on one side, plainly to be distinguised, the word "*Roma.*" This information I received from Dr. Rawlings, formerly of Fort-Hawkins, physician to the troops; a gentleman of intelligence and veracity; and have had it since confirmed by Lieutenant Thomas Spencer, of the United States troops, stationed there. In a conversation with Lieutenant Spencer in the course of last winter, he informed me, as

the result of his best observation, that there were strong reasons for believing that the place on which these ancient relics are found, had been garrisoned by an army of 100,000 men.

About fifteen or twenty miles from Fort Hawkins, in the county of Jones, there is another of these mounds of considerable size, and of the same shape. This mound is attached to a fortification of considerable extent. The fortification is on the north side of the mound, and is perfectly circular: it incloses an area of about twelve acres of land, and has four gate-ways at opposite points. It is an embankment, or earthen wall, regularly thrown up; and is now from three to four feet in perpendicular height, with an entrenchment, not yet obliterated, on the outside. On this wall there are numerous trees, as large as any in the wood surrounding it, with every appearance to induce the belief that they have grown up since the ruin of the fortification. Opposite the northern-most gate-way there is, on the inside of the wall, an oblong elevation of earth, as high or higher than the wall, of perhaps 150 feet by 80: this approaches to within ten feet of the wall, and appears to have been erected for the protection of the besieged. The mound on the south, is also inclosed by a similar wall or embankment, whose area is about one acre.

On Cedar creek, about ten miles from the aforementioned fortification, there is another still more striking in its appearances. It is situated on the summit of a very high hill, and incloses about seven acres of land. This portion of land is surrounded by a double circular wall of earth thrown up. The wall is formed by two embankments, about 20 feet asunder, of equal height, *which is now at least from six to eight feet.* There are here, as in the other, four gate-ways, nearly at opposite points, and about 20 feet wide. On the inside of the gate-way, on the north-east, there is an elevation of earth about 200 by 120 feet, and is at this time eight feet in perpendicular height, at the end next the wall of the fort, and about five feet at the inner end; about midway of its length it falls abruptly about three feet, forming something like the steps of an amphitheatre. On the end of this elevation, next the centre of the fort, the earth is cut into triangular protuberances, about 15 feet in width at their base, the angle projecting towards the centre of the fort, which protuberances form the front

of the elevation. There are small mounds, of the same elevation and shape, to guard each gateway, about 20 feet to the right of the passage. On the outside of this wall there is a tumulus, or barrow, which has never been examined, but is supposed to have been the depository of the dead.

The eye of an experienced engineer might trace the design of these elevations and covert ways to their proper objects, and explain the nature and intention of these variations in figure, but I am no engineer. Suffice it to say, that these fortifications are the products of considerable labour; that they are of immense antiquity; and that this is established by the growth of timber on their ruins. On the last mentioned wall there is an oak, which, agreeably to the generally received opinion respecting their growth, must be three or four hundred years old. Whenever it is cut, I purpose ascertaining the number of concentric circles in its trunk. There are many other fortifications of this kind over the State, but these are sufficient for our present purpose.

Independent of these traces of the ancient civilization of this country, there are others not less convincing. Dispersed over several of the upper and middle counties of this State, there are heaps of ashes to be found, containing from 100 to 150 and some 500 bushels. These heaps are seldom found alone; many are found together on the area of an acre. They contain the remains of a rude manufacture of unglazed earthen-ware, in vessels of different sizes. One piece which I saw must have been the periphery of a circle, whose diameter was at least 20 inches; these vases are carved with various figures on their outside. In these ash-heaps there have been discovered human bones, in a state so nearly decayed as to fall to pieces immediately on their exposure to the air, and assimilate their texture to that of the earth. In one of these heaps have been found weights, the one of the pound, avoirdupoise, the other the quarter of the same pound weight: they are in shape an oblate spheroid, with the poles a little flattened, and pretty well polished; they are formed of a species of impure flint-rock. They are of the same shape and substance, and evidently of the same workmanship. There are no other rocks, of the same species, near the place where these were found. They were discovered, on digging into one of these heaps, on the lands of Col. James

Lucas, of Hancock county, and are in careful preservation.

Roads are to be traced in this country of ancient date, in the middle of which the majestic oak now waves his lofty branches. I shall adduce one more fact corroborative of the opinion that this has been anciently a cultivated country.

From the situation and production of the lands, in the most fertile parts of this State, an opinion is generally prevalent among intelligent farmers, that the richest lands in this country have been once cultivated. They draw their inferences from these facts: 1st. That the declivities of the hills possess a very small portion of soil in comparison with their summits, which they suppose to have been removed by the rains, while in cultivation. 2ndly. In many places where the soil is very fertile, there is an appearance of the stones having been gathered into heaps, in the same manner as is done in modern times, to remove them out of the way of the plough, and to facilitate cultivation.

A review of the foregoing facts naturally suggests to our minds several interesting queries. By whom were these mounds of earth thrown up, and for what purpose? Are they, in every instance, an appendage to some fortification, or are they the common depositories of the dead? Are these remains of ancient habitations, exhibiting the vestiges of culinary vessels and commercial weights, the relics of savage or civilized man? If of civilized man, from what nation was he derived, or whither has he fled? Appropriate answers to these queries would furnish valuable materials to the elucidation of our geological history.

Many interesting and well-known facts conspire to induce a belief that these are not the vestiges of savage nations. The first is, that the Indians disclaim any knowledge of them. Interrogate the oldest Indian about the origin of these ash-heaps and fortifications, and he, with all his traditionary lore, exclaims, "they were not made by Indians." The next argument against the uncivilized origin of these fortifications, is drawn from the customs, manners, and habits of warfare among the savage tribes of America. Do the savage tribes intrench themselves in forts, and furnish themselves with the requisites for a long siege? They do not. Because implements of war, with which they were originally furnished, did not require the shelter of a bastion, or a pallisade. The friendly oak, or

the dark morass, are sufficient for their purpose, and it is to them they resort for protection from their enemies. And because their food, being chiefly derived from the chase in the recesses of the forest, and that in such quantities as the rigid calls of nature only shall dictate, would be but poorly calculated for subsistence during a long siege.

Their parties being small, and generally on the scout, trust to silence and address, as their best fortifications, until the savage war-whoop proclaims the danger to their unsuspecting victims.

If, then, neither tradition, nor the well-known customs of savage life, furnish us with any grounds that these are the works of savage hands, let us turn our attention to the arguments in favour of their origin among civilized people.

There are many reasons for the belief, that the continents of Asia and America were once very nearly approximated to each other; or that the passage across what is now "Behring's Straits," was easily practicable; and that people did pass from one continent to the other; and that there are still the remains of European settlers interwoven with the savages on the western waters. Added to these, the discovery of four large cities in the province of Campeachy, according to information lately received, almost affords incontestible evidence of the truth of the position, that this "New World" has anciently been the residence of civilized man.

These fortifications were erected for defence; erected by a people possessed of some knowledge in engineering, as well as tools, and a knowledge how to use them: that these people were numerous, is inferable from their burying places, as discovered on the Scioto. [See Med. Repository, Vol. XII. p. 87.]

The weights found on the site of one of these ancient habitations, prove this people to have been acquainted, not only with commerce, but affords another interesting circumstance, the identity of their weights with the English avoirdupoise pound. The tongue of the large bell, found at or near Fort-Hawkins, with the implements of husbandry discovered at some depth in the earth, afford us undeniable proof that these ancient inhabitants not only understood the use of tools themselves, but pre-supposes the importation of them, or the knowledge of assaying iron ore, tempering the metal, and converting it into tools.

This great bell must have been assigned to some steeple, a place of devotion, or some other magnificent edifice, whose ruins, with that of its inhabitants, the desolating hand of time has swept from the unhallowed view of ungrateful man. Where is the busy crowd who once assembled at the sound of this massy bell? They are gone "to that undiscovered country, from whose bourn no traveller returns."

The brass medal also declares these people not only civilized, but that their erudition had passed into some degree of refinement; medals having been invented to perpetuate some important event in the history of the nation. Whether we consider this medal as having been formed here, or brought from the country with which they had commerce, and from which they migrated, the speculations it gives rise to, are not the less interesting.

What a variety of emotions does the contemplation of these appearances inspire in the philanthropic mind! Retrospecting on the tract of time, we are carried back to that period when the portion of Georgia, now covered with the stately pine, the deep morass, or the flourishing cotton-field, was laved by the restless waves of the Atlantic: a period when these fertile plains we now inhabit, and where, not ten years since,

"Wild in the wood the noble savage ran,"

were in a state of high cultivation, and this race of busy beings inhabited the sea-coast, and were treading the ceaseless rounds of commerce; when, perhaps, over these woods fair science spread her richest panoply, contentment and peace warmed every bosom, "attuning all to love;"—or haply war's wild rage o'erspread this happy country, and man then, as in modern times, was doomed to prostrate his birth-right.

A female CALF *in which a* FŒTUS *was found immediately after birth.*

[DR. ANSON SMITH, of Kingston, in Upper Canada, informs the Editors of the following instance of fœtal impregnation, which fell under his own observation. It will

bear a comparison with the curious cases related in our vol. xiii. p. 1—8.]

SOME time in the month of April, 1807, an innkeeper of this town presented me, for inspection, a completely formed fœtus of a heifer calf, which he assured me was found in the abdomen of a heifer calf, which died a few hours after delivery. Not doubting his veracity, but supposing some mistake from adventitious circumstances, I applied to the person from whom the innkeeper received the fœtus, for such information as might be satisfactory on a subject so singular and extraordinary. This person was a farmer of reputable character, living about four miles from town, and was the owner, or in possession of the identical cow which was delivered of a pregnant calf, from whom I obtained the following particulars, to wit: That about the last day of March, 1807, expecting his cow soon to calve, the weather being cold and stormy, and not having accommodations to house her, he was induced to watch her with care, for fear of accidents which might befal her, or her calf, from the severities of the weather: that he found his cow one evening delivered of a heifer calf, in which, at first, he observed nothing singular, but that the want of maternal attention in its dam, the feebleness of the calf, (being unable to stand,) and its repeated bleatings, induced him to take it into his house, and that the calf died before morning: that he skinned the calf and conveyed the carcase to some distance behind his barn: that very soon after, being himself at the place, his dog attacked the carcase, and tore open its abdomen: that, surprised at what he saw, he took out of the belly of the dead calf the fœtus of another calf, perfectly formed, about 12 inches in length. Although not putrid or fetid, he thinks it had the appearance of having been long dead. Unfortunately, from the destruction of the body of the maternal calf, without examination, its peculiarities and malformations were imperfectly ascertained. The farmer's observations extended no further than to note some external peculiarities too obvious to be overlooked. These were, an imperforated anus, and the mislocation of the tail. The tail was a slender tuft of hair and skin, without bone, and instead of appending, as usual, from the extremity of the spinal vertebræ, or os coxcygis, proceeded from near the right os ilium, or hip bone. On strict inquiry of the farmer, he says, that the sexual external marks of a heifer calf,

were obvious and distinct, and he thinks naturally situated; but whether the intestinal, urinary, or vaginal passages were complete, he did not determine: neither did he know any thing precisely respecting the viscera, or if the fœtus were included in a uterus or not. His wife and family agreed with him in the above particular descriptions. A critical examination of the dead fœtus excludes, I think, every doubt of its being an adventitious mass of unorganized matter. The head, mouth, and limbs, the division of its hoofs, and the sexual characteristics of a female calf, were all complete. The viscera also were distinctly formed. The heart and lungs, the kidneys, and other abdominal contents, with the remains of the umbilical cord, are indubitable proofs of its having been a living organized fœtus. There was no hair on its body, but some on the end of its tail. These circumstances, together with its size, may assist conjecture with respect to its age or living state, in *utero vel abdomine;* as the cow was supposed to have been delivered of the living calf at the ordinary period of gestation.

Query. Is the above a case of super-fœtation, or a coeval conception with its foster and twin mother and sister? Is not a fœtal impregnation in utero too absurd even for conjecture?

Observations on ULCERATED TONSILS, *and the morbid affections which accompany them: in a communication to* Dr. MITCHILL, *from* HORACE H. HAYDEN *of Baltimore, Surgeon Dentist.*

I HAVE received the first number of the 3d Hexade of the Medical Repository, in which I observe a communication from Dr. Pascalis, on *ulcerated tonsils* of children; and, as I consider it an interesting subject, I beg leave to communicate to you the result of my own observations relative thereto, leaving you to make what use of it you may think proper.

When performing different operations pertaining to my profession, particularly on the internal side of the dentes molares of the inferior jaw, I am in the habit of making use of a depressor for the tongue, in order to enable me the better to perform the operation without injuring the parts,

This, in many instances, affords a full view of the fauces and glands, which have appeared in many instances diseased. Early in May last I was called to wait on a lady for the purpose of operating on her teeth, in the performance of which, as I was depressing the tongue, I observed that the right gland was much enlarged; and on the side corresponding in the opposite gland, and somewhat above the middle, was a white spot, resembling thick purulent matter. On examining it with a blunt pointed probe, I found it moveable, admitting the probe to pass with ease into the gland. On withdrawing the instrument, some of the matter was detached and adhered to the probe. On examining it, I found it of the consistence of hard curd, and of an extremely fetid smell. I then asked her if she had experienced any uneasiness or soreness in her throat, or any unpleasant sensation about the head. She answered none, except an occasional *deafness* in the *right ear*. My curiosity being in some degree excited by a circumstance so singular, I requested that their physician might be called in, thinking that if it was not new to him, I might at least be benefited by an explanation of the cause. In a few minutes he came in and I related the above circumstances to him, and, in his presence, extracted or removed from the gland, in quantity a middling-sized thimble-full of a kind of coagulated matter, offensive in smell to the extreme; since which, I have not seen or heard from the lady, nor seen a case similar, until, early in this month, a lady called to ask my advice relative to her teeth, which were in a rapid state of decay, (as were the teeth of the lady above-mentioned) and her mouth, or rather gums, in a very diseased state, although but little or no tartar or extraneous matter was found on the teeth to irritate the gums. This led me to inquire into the state of her health. She answered, that some months since she was salivated for a violent nervous fever. I asked her if her teeth were still sore—she answered, no. I then examined them particularly, to see if they were loose, which was not the case with any of them; but in doing this, I observed both glands much enlarged and ulcerated. Recollecting the case before-mentioned, I asked her if she had experienced any soreness in her throat before or since she was salivated, or deafness, or soreness in or about her ears. She answered, that some considerable time before her illness, she had a breaking out of sores on the right side of

her head; but that since her salivation they had disappeared.—(Mark this.) Knowing the lady's connexions, some of whom were with her, there was no room for any suspicions of the nature of the complaint for which she took mercury, or of the affections of the tonsils. At this time I recollect she was somewhat hoarse. It was only on Saturday, the 9th instant, I received the first number of the 3d Hexade, Medical Repository, containing the above-mentioned memoir, which I read with no small degree of interest. The same day I was called to wait on a lady, who has been for a long time, and is still subject to a disagreeable eruption of the face, and for which the different medical springs have been tried in vain. While I was engaged in examining her mouth, she observed that she was very much troubled with a disagreeable taste when she awoke in the morning.

Recollecting instantly the matter which I removed from the gland of the first lady, and seeing the state of the face of the one present, my attention was immediately drawn to the throat, where I found the right gland enlarged and inflamed, and the left gland much enlarged, with two holes in it, through which the above-described matter was plain to be seen. Knowing how easily the family are alarmed, it was not without difficulty that I could refrain from apprizing them of the state of her throat, after reading the above-mentioned memoir. On the day following, the 10th, I visited the alms-house, and communicated to the attending physician the substance of the paper you have published, and requested him to summon all the children that were subject to any of the affections therein mentioned. Accordingly six only were to be found, in examining of which, the following is the result:

No. 1. Eruptions on the head and body, left tonsil much diseased, the other not easily seen, the child being young and frightened. No. 2. Weak eyes, eruption of the head, a disagreeable herpetic affection on the back and shoulders, glands of the neck and maxilla enlarged, both tonsils diseased. No. 8. Weak eyes, eruption on the head, both tonsils diseased. No. 4. Countenance pale, much emaciated, cutaneous eruption, right tonsil much diseased. No. 5. Glands of the neck enlarged, sore head, one tonsil nearly destroyed, the other diseased. No. 6. So young and small (all of them being under six years old) as

not to be able conveniently to examine her throat. No. 7. A boy 17 years old; eruption on the head, both tonsils in a state of suppuration. No. 8. A man aged 35; an eruption for many years on the head, both tonsils in a state of suppuration. So it seems to prevail in adults as well as children; for the three first ladies were over twenty years of age.

On the 11th instant I was requested to examine (for my own satisfaction) the state and appearance of a boy's mouth, about ten years old. I found, on the right ride of the superior jaw, under, and a little anterior to the zygomatic process, a very considerable enlargement, somewhat like a tumour, of the size of half a hen's egg, extending from the first adult molares to the nose; very hard, and without any particular or uncommon degree of sensibility: the roof of the mouth, on the same side, seemed to be occupied by the half of the tumour, equally hard, and without pain on pressure; constituting, in the whole, the bulk of a full sized egg. On examining the teeth, I found the two infant molares, on the same side, considerably decayed. I inquired of the lady who was with the child, if he had received any blow or fall on that side of the face. She answered no. I asked her how long since the first appearance of the tumour. She answered about seven weeks, during which time he had manifested no symptoms of pain. I then inquired of his health, and was informed that he had enjoyed good health, except being troubled with "a breaking out on the head." Not seeing any appearance of it, I asked how long since it disappeared; and was answered between seven and eight months. I then examined the tonsils: I found them in a very diseased state; one of them almost destroyed. I then asked the boy to put his finger on the place most painful or sore about that side of his face. He immediately put his finger over the roots of the infant molares, which I before observed were decayed. These circumstances led me to suspect that it will terminate in a monstrous exostosis, or a polypus of the antrum maxillare. Whether I am correct, or not, I advised the extraction of the two teeth.

Sept. 14, 1809.

REMARKS *on the* YELLOW FEVER *of* NEW-YORK *in* 1741, *and* 1742; *by the Hon.* CADWALLADER COLDEN. *Written in* 1743. *Communicated to the Editors by his Grandson,* C. D. COLDEN, *Esq.*

[Continued from p. 9, No. 1. vol. 2.]

STAGNATING waters are not so hurtful to those that have been accustomed to such an air, as to those who come from a clear, healthy air.

It is more dangerous to sleep in such an air, than to use exercise in the same air; for it is observed that the vessels of any animal imbibe more of the moisture of the atmosphere while they sleep, than when awake.

The ill effects of noxious vapours increase with the heat, and frequently grow pestilential about autumn. The reason of this is, that in the beginning of summer the vapours are diluted and mixed with a greater quantity of water, which blunts the force of the noxious particles, than in the autumn, when the purer parts of the waters are all spent and carried off.

Stagnating waters are never noxious in the winter, because the winter cold stops all fermentation; consequently the emission of noxious vapours.

The effects of noxious vapours are different in different constitutions of the air, and in different climates; for all fermentations are altered by the different state of the atmosphere; and this is the reason why the same kind of spirit cannot be produced from molasses in North America, that is produced from molasses in the West Indies, and of the different kinds of spirits produced in the several Islands. The different state of the atmosphere is the reason of the different effects that these noxious vapours, from stagnating filthy waters, have on the animal œconomy; because, not only different kinds of vapours are raised from a different fermentation in the stagnating fluids, but they raise likewise a different fermentation in the animal fluids. Hence different kinds of fevers produced in different constitutions of the air; and for the same reason physicians are never certain of the method of cure till by different and repeated experiments they discover what is prejudicial or

helpful; for the different states of the atmosphere are not to be distinguised by the organs of our senses.*

These two or three last years (so far as I can recollect from my memory, for I have not made any particular observations) we have had in general fewer thundergusts than usual, though sometimes a few sharp ones in particular places, and fewer north-west winds succeeding those thundergusts. Now these thundergusts disperse the vapours, and are observed likewise to obstruct fermentations, as appears by their effects upon fermenting liquors, beer, wine, and cider, while new and fermenting, and upon eggs, while hatching. If this be confirmed by the observations of others, it may give a reason why these noxious vapours may have produced more direful effects, these two last summers, than usual.

I shall next take notice of some things which one, not very nice in observing, may have taken notice of in America, in confirmation of Lancisi's observations. First, it is generally observed, that all over North America, that, where the salts and freshes meet, if it be marshy oozy ground, those places are most subject to intermittent fevers, and sometimes to fevers of a malignant nature.

I remember that, several years since, when I was at Bristol, in Pennsylvania, opposite to Burlington, which is situated to the northward of a large space of swampy ground, they told me that they had been, from the first settling of Bristol, subject to intermittent fevers of a malignant kind; and, indeed, the aspect of the inhabitants showed the effects of the air which they breathed while I saw them. They assured me, at the same time, that not above two or three children, born in that village since its first settling, had arrived to the age of maturity. But since that time these swamps having been drained and converted into profitable meadow grounds, I am informed that Bristol is, in a great measure, freed from these annual epidemical fevers.

It is well known that the Paltz-river, or Wallkill, in Ulster county, in this Province, has been long taken notice of as very prejudicial to the health of those who live near the banks of it. The waters of this river are of a dark colour,

* For this reason, the safest prescription a physician can make to his friend is the pilulæ ex tribus, as it is commonly called, viz. cito, longe, tarde; or cede cito, long; inquus abi, ferusq reverte.

and are known to come from a large space of ground overflowed with stagnating waters. The inhabitants along this river are well known to be yearly afflicted with intermittent fevers during the summer season; and a constant fog or vapour is observed almost all summer, except in the time while north-west or northerly winds blow, to arise over that river, and to remain there to a certain height and distance, every morning, till the heat of the sun disperses it; and frequently likewise in the evening. I have observed these intermittents to have different degrees of malignity in different years; and that these last two years they have been more malignant than usual. There may be a reason given for their malignancy this last summer, besides that of the fewer thundergusts, which were common with the year before, viz. The great number of ground-caterpillars, which destroyed the grass in the meadows from whence this river and the streams which run into it arise, and which died there, and raised a very offensive smell.

I have known some of the inhabitants along this river, who, by removing their habitations to a small distance from the river to higher ground, and to the south side of the river, have freed their families from the influence of these noxious vapours; but a removal on the north side, has not been so effectual in preventing these ill effects, though it was to a high ground.

I shall, in the last place, endeavour to apply some of the preceding observations to New-York in particular. 1st. It is well known that the part of the town chiefly afflicted with the epidemical distemper these two last summers, is built upon a swamp, or moist slimy ground; that it is flat, and the water not easily drained from thence; that some other parts of the town are likewise built upon low swampy grounds, and that the moisture of these grounds is to be observed almost in every cellar of the houses built on them. 2dly. No person that walks along the docks but is sensible of the filthy smell there, especially in the slips; that, by an intolerable carelessness, the nastiness of the town is thrown into these slips, at such a distance from the stream of the river that it is not carried off, but remains there, and is observed to ferment to such a degree, that it appears, as it were, boiling to the eye of the spectators. 3dly. That there is no constant and sufficient care of the drains by which the cellars are freed from stagnating water; and that

the cellars themselves are seldom or never cleaned after the settling of the corrupted slime. 4thly. That these parts of the town have been always subject to epidemical disorders, every summer towards autumn, especially among children, and that there is a yearly mortality among infants, and disorders more frequent at that time than usual in healthy places. I know that the fruit of that season is generally blamed as the cause of disorders among children; but if it be considered that the children in the country eat more plentifully of all kinds of fruit, and yet remain free from those disorders, and that the keeping of children in the city entirely from fruit does not save them from the endemical diseases of the town, they must be attributed to some other cause; and, from the above observations, what more likely to be the cause than a faulty atmosphere of the place?

What has been before observed naturally leads us to the preventive remedies of the annual endemical diseases of New-York; that is, carefully to drain out the slimy, wet grounds; to fill up the slips; to take care that all the filth and nastiness of the town be emptied into the stream of the river; for which purpose it will be necessary for the magistrates to think of effectual regulations, and to put them diligently in execution. I am of opinion this cannot be effectually done but by the drains being put entirely into the hands of the corporation; for as they are now in the hands of private persons, it is managed only by a voluntary subscription, and depending on the humours and inclinations of a great number of persons, many of them penurious, negligent, and insensible of the prejudices which follow, on the drains not being kept in good order; and as the work cannot be carried on but by a general consent, it must often fail, as is but too well confirmed by experience: whereas, if these drains were managed by a public tax, then every one, since it would cost him no more, would be desirous and careful to have his cellar clean and dry, and his nostrils freed from an offensive stench. But even in this case, to make this work carried on effectually, the care of the drains must be put under the direction of men of known industry, and zeal for the welfare of the town; and to bind those who shall have the direction more effectually to their duty,

it should be so ordered that every man may have an action for any damage he shall suffer by a neglect of the drains.*

It will be objected, probably, that the late distemper in New-York has been imported by infection from abroad. Suppose it be; yet this does not make it less necessary to drain the wet and moist grounds in and about the city, and to keep it clean and sweet; for it is well known that some airs and constitutions of the atmosphere are much more proper to feed and propagate infection than others; that an air filled with corruption is a fit nourishment for infection; for it is observed often to proceed from thence, as has been many times observed in camps, towns besieged, prisons, and ships crowded with people, where sufficient care has not been taken to keep them clean.

The different state of health was very remarkable in the city of London, before the fire; when the streets were narrow, ill-paved, and few drains. Since that time the streets are straight, open and airy, and many drains, and the streets are carefully kept clean, especially by the advantages of the new river, which, since that time, has been brought into the city, by which all the filth and nastiness of the town is washed away.

In the year 1592, 25,886 died, of which
11,503 of the plague.
1603, 37,294 died, of which number
30,561 of the plague.
1625, 51,758 died,
35,403 of the plague.
1630, 10,545 died,
1,317 of the plague.
1636, 23,359 died,
10,400 of the plague.

1665, a greater number died of the plague than any time before: by which it appears that the plague was in London once in twelve years, one time with another, before the fire of London; whereas since the fire, it has not once been there in 77 years.

Indeed, the supposition of the infection being brought from abroad, makes the reasons for cleansing the city, and

* If the magiſtrates ſhall think the aid of the legiſlature neceſſary, more effectually to enable them to perform their duty in this caſe, it cannot be doubted that they will eaſily obtain it, on a proper information and application.

keeping it clean, more strong, rather than weakens them. It is well known that these infections are like a leaven, which will lie dead in cold weather; but as soon as the weather becomes hot, they ferment anew, and propagate and spread wherever they can find a proper subject to work upon, which it is allowed that all filth and corruption, mixed with moisture, is. It is likewise observed that some constitutions of the air, or atmosphere, are much more proper for propagating pestilential infections than others, as may have been particularly observed of the small-pox; that sometimes it has been imported into places where only one or two, or a very few, have been taken with it; after which it has ceased, without any particular care of the inhabitants to avoid it, but by the atmosphere's being void of those vapours which are proper, and perhaps necessary, to feed it.

The plague has not been less frequent in several places, with which London entertains commerce, since the year 1665, than before; on the contrary, the commerce of the city of London has been much increased since that time; and for that reason it can hardly be doubted but that infection has been several times imported since the year 1665; and there are some instances of its having actually appeared in some parts of London, but the atmosphere of London being less proper to propagate the infection, it has been much more easily stifled by the care of the inhabitants. But besides this of taking away the proper nourishment of the pestilential leaven, it will be necessary to destroy the leaven itself; and this, most probably, is preserved in the filth of the town: so it is likewise observed to be often retained in clothes, especially woollen clothes, which keep it warm, and defend it from the severity of our winters, when the cold, otherwise, would destroy it. It may be necessary, for this reason, that, by public authority, every house, and corner of the house, be cleaned out, under severe penalties where neglected; and all the clothes and apparel be exposed to the open air, in the coldest season of the year, and that for several days together.

It is very difficult for the magistrates to take proper care to have this effectually done in every house and corner. Some people are so wretchedly stupid, that rather than take some trouble for a few days, will rather risk their own health, and even the destruction of the whole community. It is for this reason that many wise legislators instituted reli-

gious fasts and purifications towards the end of winter, in order to engage the more thoughtless people to the performance of so necessary a duty, by enforcing it upon their consciences as a religious duty commanded by the immediate edict of the Deity.

There is no doubt that it is a duty incumbent on us by all laws, human and divine; and whenever the magistrate shall enjoin this work, it will be duty of christian ministers to inculcate the punctual performance of it on their hearers. That men's consciences, being awakened by the heinousness of the sin, as the neglect of so necessary a duty certainly is, may excite them to the destroying of this destructive leaven.

In the last place it is necessary to observe, that the summer is no proper season for cleansing the city from corrupting filth; for the stirring it at that time increases the quantity of vapours prodigiously; and the doing it has been observed to produce the most direful havoc among the inhabitants. The most proper season is towards the end of winter, when the fermentation is entirely destroyed; and the doing it at that season will have another advantage, that less filth, collected in the winter, will remain on the approach of summer.

REVIEW.

A Dissertation on the Progress of Medical Science in the Commonwealth of Massachusetts. By Josiah Bartlett. Boston. Wait & Co. 8vo. pp. 48.

THIS handsome exercise was read at the annual meeting of the Massachusetts Medical Society, on the 6th June, 1810. It is dedicated to Dr. Thomas Welsh, a gentleman who is considered worthy of the compliment, on account of his services as a surgeon in the revolutionary army; for his assiduity in various important offices in the Massachusetts Medical Society; for his judicious services in a branch of the marine hospital of the U. S.; for his long-approved conduct as physician to the Boston board of health; and more especially as a token of gratitude for the patronage and support extended by him to the author.

The history of medicine in Massachusetts may be divided into the following epochs: 1st. From the settlement of the colony in 1620, to the foundation of Harvard College in 1638. 2. From the institution of this noble seminary to the inoculation for small-pox by Zabdiel Boylston in 1720. 3. From the commencement of the variolous practice to the introduction of the vaccine by Benjamin Waterhouse, in 1799. 4. From the latter era to the present time.

It is agreeable to examine such a tribute as this to the memory of the cultivators of medicine in former days. As we wish that posterity should be mindful of us, it is our duty to remember those who have gone before us. The present performance is a respectful offering to the genius and merits of the practisers and benefactors of physic, in the commonwealth to which the author belongs. It is reputable to Mr. Bartlett that he has given so instructive a compendium of professional history. In this he has accomplished a work that may be mentioned in connection with the Medical Biography of South-Carolina by Rr. Ramsay.

New-York, as well as most other States in the Union, is very much in arrears with respect to this kind of knowledge. To our shame, it has been remarked that our predecessors are almost immediately forgotten. It is a gloomy reflection that our extreme occupation in our own selfish concerns, precludes the greater part of the improvement which the lives and experience of the worthies who have gone before us might most readily afford.

We hope that the reproach of neglecting too much the merit of physicians, who have once acted their parts with distinction in this life, and are now no more, will soon be removed from the character of the New-Yorkers. Our Magraths, Joneses, Middletons, Farquhars, Bayleys, Nicolls, Smiths, Bards, Charletons, M'Knights, Treats, Youles, Seaburys, and Cochrans, deserve more detailed biographical notices than they appear hitherto to have received. And that we may not be considered as giving advice without doing something, we annex sketches of two physicians, and two lawyers of New-York, by way of encouragement to those who may feel inclined to attempt this kind of writing.

1. DOCTOR DUBOIS.

The oldest New-York graduate in physic that is recollected, was *Isaac Du Bois*, who took his degree at Leyden in 1740; at which time he published a dissertation, "De Sanguinis Missionis Usu et Abusu." He was, as appears from his dedication, a son of Walter Du Bois, then a minister of the Reformed Dutch Church in New-York. By this dissertation it appears there was a physician of note in New-York at that time by the name of John Nicoll.

On the subject of the dissertation, Paul Gyöngyössi, a Hungarian, addressed to the new graduate the following curious Latin verses:

Si fuerit *sanguis peccans*, tum tundito venam;
Sed sis persuasus, *Sanguinolentus eris*.
Fundatur (lex ipsa jubet) *pro Sanguine Sanguis*;
Sicque fores DUBOIS, *sanguinis* ipse *reus*.
Sed tamen absolvo nunc te omni crimine DOCTOR;
Hoc tantum monito, *Sanguis ut arte fluat*.
Et cum jam DUBOIS DOCTOR, remeabis ad Indos,
Tunc primum poteris vertere ad arma manus.

2. PROFESSOR DUPUY.

A very promising and estimable physician, who flourished soon after, was *John Dupuy*. Under him was educated Samuel Latham, one of the most respectable practisers of his time on Long-Island. Dupuy died young; but his pupil, Latham, lived until 1782, and did abundance of good by his professional services, and by the liberal distribution of his property and patronage. With some difficulty the following inscription on a tomb-stone in Trinity church-yard was brought into view and copied. Some friend of Dupuy, apparently of the family of Ellison, seems to have interested himself in this expression of respect to his memory:

"Condignæ famæ et æternæ memoriæ sacrum nuper perfuncti D. JOANNIS DUPUY, C. et A. M. Professoris literati in Provincia Neo-Eboracensi, qui A. D. 1745, atque ætatis suæ 28, ex hoc vita migravit.

"R. E. affectu hoc posuit."

3. GOVERNOR BURNET.

By observations made at New-York in 1723, by Governor Burnet, on the first satellite of Jupiter, it appeared that Fort James, which stood nearly where the custom-house now is, at the lower end of Broadway, was 74° 57′ 30″ west of Greenwich, in England; which corresponds to 4h 58′ 30″ in time. An abstract of this learned gentleman's paper may be seen in Messrs. Reid and Gray's abridgment of the London Philosophical Transactions, vol. 6, p. 366.

4. COUNSELLOR ALEXANDER.

The efforts repeatedly made by the European nations to measure an arch of the meridian was considered by Mr. *J. Alexander*, in 1737, to have a connection with the peculiar fitness of the space between New-York city and Albany for such an experiment. He observed that a very exact observation for that purpose might be made here, because Hudson's River is frozen over from New-York up to Albany, and its course is very strait, almost true north, and the distance between New-York and Albany is above one hundred and fifty miles. New-York is in lat. 40° 40′ nearly; so that the length of above two degrees of latitude on the earth might be measured with much more exactness than

it was possible in England or France, because of the ascents and descents and curved lines, which he thought they would be continually obliged to make allowances for; from all which difficulties the measurement here on the ice would be clear. (Phil. Trans. abridged by Martin, vol. viii. p. 339.)

Before we conclude our remarks on this respectable performance of Dr. Bartlett, we take occasion to recommend it to the perusal of all who wish to examine an history summary of medicine in Massachusetts, or are desirous of a pattern to work by, in their respective cities and states.

Notices concerning Cincinnati. By DANIEL DRAKE.—Cincinnati. Browne & Co. 1810. 8vo. pp. 32.

PIECES of topographical description, like this, are very instructive. The present composition is replete with information concerning the physical constitution of the new and rising State of Ohio. We hope the industrious and ingenious author will continue his researches; for, from one who has done so well, we naturally expect more.

We extract freely from this short publication Mr. D.'s description of Cincinnati, his geological account of the neighbouring region, and his opinion of the climate in that district of North America.

His notices of the place itself, are as follow:

"Cincinnati, situate on the northern bank of the river Ohio, in a bend of gentle curvature, is in 39 deg. 7 min. N. Lat. and about 84 deg. 30 min. W. Longitude.

"Its site is not equally elevated. A slip of land, called the Bottom, (most of which is inundated by extraordinary freshes, though the whole is elevated several feet above the ordinary high-water mark,) commences at Deer-creek, the eastern boundary of the town, and stretches down the river, gradually becoming wider and lower. It slopes northwardly to the average distance of 800 feet, where it is terminated by a bank, or glacis, denominated the Hill, which is generally of steep ascent, and from 30 to 50 feet in height. In addition to this, there is a gentle acclivity for 6 or 700 feet farther back, which is succeeded by a slight inclination of surface, northwardly, for something more than half a mile,

when the hills, or real uplands, commence. These benches of land extend north-westwardly, (the upper one continually widening,) nearly two miles, and are lost in the interval grounds of Mill-creek. The whole, form an area of between 2 and 3 square miles; which, however, comprehends but little more than a moiety of the expansion which the valley of the Ohio has at this place. For on the southern side, both above and below the mouth of Licking river, are extensive elevated bottoms.

" The hills surrounding this alluvial tract, form an imperfectly rhomboidal figure. They are between 2 and 300 feet high, but the angle, under which they are seen from a central situation, is only of a few degrees. Those to the S. W. and N. E. at such a station, make the greatest, and nearly an equal angle; those to the S. E. and N. W. also make angles nearly equal. The Ohio enters at the eastern angle of this figure, and after bending considerably to the south, passes out at the western; Licking enters through the southern, and Mill-creek through the northern angle. Deer-creek, an inconsiderable stream, enters through the northern side. The Ohio, both up and down, affords a limited view, and its valley forms no considerable inlet to the E. and W. winds. The valley of Licking affords an entrance to the S. wind, that of Mill-creek to the N. W. and that of Deer-creek, (a partial one,) to the N. E. The other winds blow over the hills that lie in their respective courses.

" The Ohio is 535 yards wide from bank to bank, but at low water much narrower: no extensive bars exist, however, near the town. Licking river, which joins the Ohio at right angles, opposite the town, is about 80 yards wide at its mouth. Mill-creek is large enough for mills, and has wide alluvions; which, near its junction with the Ohio, are annually overflown. Its general course is from N. E. to S. W. and it joins the Ohio at a right angle.

" Ascending from these valleys, the aspects and character of the surrounding country are various. On the southern, or Kentucky side of the Ohio, the land is hilly, and the interval grounds narrow: on this side, the land is more level, and the interval spaces wider. These spaces are covered with large sycamores, hackberries, poplars, (liriodendron tulipifera) the beech, (fagus Americanas) the buckeyes, (esculus) hickories and walnuts, (juglans) honeylocusts,

(gleditsia triacanthos) 2 or 3 oaks, (quercus) paupaw, (annona glabra) grape-vines, (vitis serotina) 2 species of ash, (fraxinus) sugar-trees, (acer saccharinum) black locust, (robinia pseudacacia) and most of the other 40 or 50 trees and shrubs, which compose the *Arbustum Terræ Fertilis* of the western country. While the shores of the creeks and rivers are embellished by willows, (salix) cotton-trees, (populus deltoid) and red maple, (acer rubrum.)

"The uplands produce either the trees already mentioned, or the numerous species and varieties of oak, or beech, or the whole blended together, according to their differences in fertility and moisture.

"No barrens, prairies, or pine lands, are to be found near the town."

The observations on the disposition and kind of the earthy strata thereabout, are in these words:

"The internal structure of the site of our town, demonstrates that it is wholly "made ground," and that water has been the immediate agent. On the upper division, or Hill, the soil near the eastern and western extremities is better, but in the middle it is extremely thin, exhibiting every where the loam over which it is spread. This loam, which constitutes the second stratum, is from 4 to 8 feet in depth. It presents but few varieties, affording, besides the sand and brick-clay which compose it, nothing more than occasional siliceous pebbles, and fragments of argillaceous grit. This layer is supported by a grand stratum, composed of pebbles, gravel and sand. It is of unknown thickness, wells having been dug to the depth of 80, 90, and 100 feet, without passing through it. The particulars which have been observed respecting its construction, are the following:—1. The sand, gravel and pebbles, are commonly blended together; but, in some places, the sand exists in beds distinct from the others. These beds are found at considerable depth, and generally exhibit in the position of their particles, a kind of oblique or wave-like stratification, while that of the superincumbent gravel is more horizontal. 2. A large portion of the pebbles of this stratum, are opake calcareous carbonate; the rest are semi-transparent, white, blue, brown, and red amorphous quartz; flint, and several varieties of granite; some of which are undergoing decomposition. The calcareous fragments are discoid; the siliceous approach more or less to the globular figure.

They are all water-worn, and resemble those found on the beaches of our rivers.—3. In some places these pebbles are cemented by carbonate of lime into breccia. It is somewhat tabular, and horizontally disposed.—4. No fluvial shells, nor exuviæ of any kind, have been found in this stratum, except a solitary vertebra of the mammoth, which lately was discovered about 20 feet below the surface. It had no doubt been deposited there at the same time with the gravel, among which it was found.—5. Veins of loam, highly coloured, and of fine blue clay, have been occasionally found, more especially along its southern border.—6. In the well of Capt. Prince, at the depth of 36 feet, that of Judge Symmes, at 20 feet, and of Jacob Burnet, Esq. at 90 feet, fragments of vegetable matter have been found. In that of the latter gentleman were dug up the stumps or foundations of two trees; one of considerable size, the other smaller. They were represented by the workmen as having grown there; but from the very depressed situation they occupied, and from their resting on sand, it is more probable they were *deposited* there, indicating that to have been once the bottom of a lake or pond, rather than the surface of the dry ground. And this opinion coincides with Mr. Volney's supposition of an ancient lake in this country.—7. The wells of Major Ruffin, Judge Symmes, and General Lytle, all in a line from the river, have formerly afforded water, considerably impregnated with iron, and probably also with sulphur; both of which might have been supplied by the decomposition of fossil wood. And where this line intersects the river, the sand and gravel of the beach are cemented into a kind of ferruginous breccia, by oxyde of iron.

"Such, as far as has been explored, is the structure of the higher alluvion; that of the lower, or Bottom, differs from it in some respects. The layer of mould is several feet thick, and gradually changes into clay, which terminates about 20 feet from the surface. After this, sand and gravel present themselves, and continue to the calcareous and schistous strata, which underlay the town and adjoining upland.

"Of the geology of the surrounding country but a partial account will be attempted. Its alluvial portions, like those already described, consist of mould, loam, clay, sand and gravel, to the depth of several feet. The superior strata

of the uplands are mould, from 6 to 24 inches deep, and loam, with loose horizontal limestones and fragments of argillaceous sandstone, to the depth of from 6 to 12 feet. These strata, on this side of the river, are supported by argillaceous schistus, (the argilla fissilis of Turton's Linnæus) alternately and horizontally disposed with calcareous rocks; which construction continues as low as we have yet penetrated. The former substance, in quantity, greatly exceeds the latter, and really gives to this part of our State a *schistous* character. It has a dull blue colour; breaks into thick irregular discoid fragments; softens and is diffusible in water, from which it is probably, in certain situations, deposited, forming beds of potters' clay, (argilla lithomarga;) it adheres to the tongue, can be scratched with the nail, effervesces with acids, feebly before, but briskly after pulverization, and has 2.55 specific gravity. It contains neither sulphur nor bitumen. The limestone in this region is from 1 to 18 inches thick; is found in oblong, or irregular indeterminate angular pieces, of various sizes; has a coarse grain, and is of different densities, with the medium specific gravity of 2.65. The lime obtained from it is said to possess great strength, but adheres slightly, and is not very white, no doubt from the abundance of iron it contains.

"An observer, upon examining this calcareo-schistous region, is ready to pronounce, that the limestone is nothing but indurated slate; for the change of density and texture, from one to the other, is, in many places, so gradual as to be perfectly imperceptible. This, however, can only be determined by chemical analysis.

"Several varieties of marine exuviæ, which I am not now prepared to enumerate, are found imbedded in, or impressed on the surface, of these calcareous stones. The slate also is not without appearances of this kind, though they are not so numerous, nor so large.

"Along the beach of the Ohio, smooth lumps of sandstone, of different degrees of hardness, and of various colours and sizes, are by no means uncommon. In the lower bank of Licking river, just at its junction with the Ohio, but more especially in some of the river hills, about 15 miles above this town, are huge shapeless masses of breccia, or pudding stone. It consists of rolled, calcareous and siliceous pebbles, cemented by carbonate of lime. It is

found in hills which appear to have had a secondary formation, and constitutes their nuclei. As we advance into Kentucky, the proportion of argillaceous matter decreases rapidly, until at length dense, thick, almost interminable, calcareous rocks, separated but slightly, form the solid foundation of that State. It has been asserted, that the prevalence of schistous matter ceases at the Ohio river: this may be the case in some places, but it certainly is not every where.

"Granitical pebbles have been already mentioned, as frequently occurring in the alluvion on which our town is built; but *they* are not *all* the granite this country affords. About 15 miles north of this place, is a zone or region of larger masses of that compound. It runs from east to west. These masses, some of which are several feet in diameter, are of a reddish colour, amorphous, smooth and perpendicularly stratified. It is believed, that similar fragments are bestrewn over most of our State.

"The country, between this and lake Erie, is probably erected on a frail calcareo-argillaceous foundation: but little, however, is accurately known concerning any portion of its natural history.

"From even this cursory topographical and geological view, we perceive the reason why this State abounds, considerably, in interval lands, and durable springs; while in Kentucky, the springs, though numerous during the rainy season, are transient, and the interval spaces narrow. In that State, the hills are generally steep enough to convey most of the rains rapidly away; and what water does filter through the soil and clay, is arrested by the broad impermeable rocks, and conducted to the banks of the numerous creeks, where it bursts out in temporary springs. The surface of this State, in most parts, is so level as to retain a large portion of the water which falls, while the frailer structure of the ground readily permits it to sink below the region of evaporation, where it collects and forms permanent springs. In Kentucky, the rivers and small streams can effect but little, in a lateral direction, against the dense calcareous rocks, which every where abound beneath the surface, and therefore are restricted to narrow limits. In this State, the rivers and creeks are constantly undermining and wearing away their resistless and crumbling banks, and thereby widen their valleys.

"About one mile up Licking river, are several copious chalybeate springs, which, however, are covered with water, except when the river is low. To the east of the town, from under the hill beyond Deer-creek, there bursts out a feeble vein of water, considerably impregnated with sulphate and muriate of soda. But few springs exist about the town. Wells are more common, though not very numerous: most of them terminate in sand and gravel. The water they afford is hard, incrusting the vessels in which it is boiled. It contains uncombined carbonic acid, carbonates, muriates, probably nitrates, but no sulphates.

"That of the river is softer: In November last, when it was partially examined with chemical tests, it appeared to contain muriate of soda, and uncombined soda. At other seasons of the year it no doubt contains other principles."

After expressing a sentiment that the belief entertained by several respectable writers, of the greater heat of the regions west of the Alleghanies, in equal latitudes, above that of those to the eastward of them, is not altogether correct, Mr. D. pursues his observations in an impressive style, from p. 15 to p. 19. These, however, we have not room to insert.

MEDICAL AND PHILOSOPHICAL INTELLIGENCE.

Anecdote of the late Dr. Berkeley, Bishop of Cloyne, by Josiah Meigs, L. L. D. and President of the University of Georgia, in a letter to Dr. Mitchill.

"THE question relative to the first peopling of this continent, has justly excited the attention of reflecting men. I have often heard the late excellent Doctor Ezra Stiles, President of Yale College, relate the following anecdote: When Doctor Berkeley, Bishop of Cloyne, arrived at Newport, in Rhode-Island, about the middle of the last century, with a view of establishing a seminary of learning in America, he had with him, as a companion and friend, a Mr. Smibert, a celebrated painter of the Flemish school. In a few days after their arrival, Mr. Smibert saw in the streets a number of Narraganset Indians. At the first sight of them he expressed great surprise, and asked how those Tartars came there? On being asked why he called them Tartars, he replied, that, some years before, when he was at Florence studying his profession, the Grand Duke of Tuscany had received, as a present from the Sovereign of Russia, several Tartars, who had been taken prisoners: that he, Mr. Smibert, had been employed in drawing their portraits; and that their features were so much like those of the Narragansett Indians, that he was perfectly confident they were of the same family and race.

"I need not observe, that a painter's business is to observe, with the most minute accuracy, the features of the human face, and that the conjecture of a migration of Tartars from the Eastern shores of Asia to our Northwestern region, is considerably strengthened by this anecdote."

Note.—An opinion of the Tartar-appearance of our North American aborigines, was instantly formed by Sidi

Mellimelli, the Tunisian envoy to the United States, in 1805, on beholding them. His curiosity was highly excited by the view of the Creeks, Cherokees, and Osages, who visited the seat of the national government, during the congressional session of 1805-6. He seemed as if he would never be weary of contemplating a race of men, with whom he could cordially shake hands as brothers, and by whose dissimilarity of features and complexion to the European, he was peculiarly struck. The sight of these Americans persuaded this Turk at once, of their Asiatic origin.—Edit.

Callet's Logarithms, for the American Market.

THE tables of logarithms revised by the French mathematician, Francis Callet, have been printed at Paris in Stereotype, by Firmin Didot, who has acquired such great fame by his editions of books in that country. The logarithms of all numbers are given, from 1 to 108,000; as are also the logarithm sines and tangents to every second for the first five degrees, to every ten seconds for all the degrees of a quadrant of the circle, and to every ten thousandth part, according to the new centesimal division. This book further contains three new tables of logarithms, to twenty, forty-eight, and sixty-one places of figures; and several other tables useful in ascertaining the longitude at sea. These tables, composed of immaculate rows and columns of cyphers, are not intended for European use only. An edition is prepared for the American mathematicians. For this purpose Mr. Callet's prefatory discourse on the nature of logarithms, and the use of the tables, has been translated into English by David B. Warden, Esq. and prefixed to the stereotype pages. In an introduction by the author, the methods of John Napier, Henry Briggs, and Adrian Vlacq, are particularly mentioned; as are likewise the labours of Scherwin, Wallis, Halley, Sharp, and Gardiner. An edition of Gardiner's tables had been given at Avignon, in 1770, by John Aubert, a printer, under the revision of Father Pezenas, and with logarithm sines to every second of the four first degrees, calculated by Mr. Mauton. Astronomers having at length complained, especially navi-

gators, that Gardiner's tables, being in a large quarto, were inconvenient on account of their size, Mr. Alexander Joubert was induced to prepare a portable edition, and Mr. Didot to print it.

The additions which Mr. Callet has made in the present edition to the calculations of his predecessors, are briefly stated in the introduction, to which we refer.

Another Meteoric Stone, possessing, apparently, new Qualities.

CAPTAIN Bennett P. Gatewood certifies thus to Messrs. Dunham and Hawkins, editors of the Rhode-Island American:

"On the 17th of June, 1809, I took my departure from Block-Island, bound to St. Barts. We were steering E. S. E. and a southerly wind was blowing very brisk; the sky was cloudy and squally, accompanied with rain, sharp lightning, loud thunder, and a rough sea. At three days' sail from Block-Island, in lat. 30, 58, N. long. 70, 25, W. at 11 o'clock at night, a sharp and uncommon noise was heard astern of the vessel, resembling, somewhat, the report of a pistol, at two distinct and different times. A few minutes after this noise, the clouds separated over head in the shape of a fog rainbow, and *at that moment a stone fell on our deck, and at the same time a large quantity fell in the water under our lee, at the distance, I should judge, of about twelve feet.* In about five or six seconds afterwards, the fog rainbow descended to the horizon. I suppose, from the quantity that fell in the water, that, had they fell on board, we should have suffered material injury. The stone that fell upon the deck I have preserved: it weighs above six ounces, is of the colour of iron, and appears to be impregnated with copper. Whether this stone was drawn up by a water-spout, which broke a little astern of us, I leave for others to judge.—The weather still continued very thick and cloudy, attended with rain, sharp lightning, heavy thunder, and a rough sea. This stone may be seen and examined by any person who wishes to gratify his curiosity, by calling at the residence of Captain Gatewood, in Westminster-street."

To which these gentlemen subjoin the following note:

"The Connecticut meteor that terminated in a stone, has excited much discussion amongst learned philosophers, both in our country and in Europe.

"We embrace the earliest opportunity to communicate any facts to the public which may throw light on this interesting question. Instances of phœnomena of this kind, both ancient and modern times have been witnesses of, and the cause still remains unexplained. We have examined the stone, and it appears to be composed of iron, with spots of a substance resembling verdigris interspersed, which leads to the supposition that it is impregnated with copper."

On which we remark, that the formation of atmospheric stones is not necessarily occasioned by a fiery meteor, (Med. Repos. Hex. 2, Vol. V. p. 419;) nor by an icy incrustation, (Ibid. Hex. 3. Vol. I. p. 189;) but may take place under circumstances exceedingly different, as in the present instance. Whereupon it may be concluded that we are, as yet, but partially acquainted with the facts, on this curious branch of meteorology.

Spontaneous Inflammation and Decomposition of the Human Body.

AN unhappy event has lately offered to the ministers of the healing art a new subject for the most serious reflections. Mrs. Boyer, aged 72, very fat, of sedentary habits, weighing about 250 pounds, rather addicted to wine, living at 292 Dean-Street, in Paris, was seen in good health at 10 o'clock on Christmas eve. As the clock struck 12, a neighbouring woman passed her door, and at that time there was no indication, either by light or smell, of any thing being on fire. At 3 o'clock in the morning a young man, living in the opposite house across the street, was awaked by an extraordinary light shining into his windows. Uneasy at the occurrence, he roused the porter, and judging that this singular illumination proceeded from the chamber of Mrs. Boyer, they went up to it. They knocked at the door to no purpose, and at length concluded to force it. They were saluted by a thick and extremely fœtid smoke; beyond which they found a shapeless heap of greasy ashes.

Upon this, in an inconsiderate moment, for the purpose of affording help, they threw several buckets of water. Presently, however, they were frightfully undeceived, for, on opening the windows, and dissipating the vapours, they discovered a leg and its thigh, the only remains of the unhappy woman whom they had attempted to assist. It will be observed that this extremity was neither indurated nor tumefied. It would seem that at the first moment of the accident, the unfortunate woman had attempted to relieve herself from the fire which consumed her; for they found a water-pot overturned on the floor and broken. Her sad remains were distant six steps from her chair, which was burned, as well as her clothes and some moveables. The high degree of heat acting on this occasion, was evinced by the sooty varnish which incrusted all the windows, the principal part of which were burned and cracked. And all this combustion was completed in less than three hours. Beneath her chair was found a foot-stove containing coals. This appears to be an example of spontaneous combustion, like those related by Jacobœus, Wilmer, Bohausen, Muraine, Merille, Bouffet, Bianchiny, Maffey, Rolli, Lecat, and D'Azyr, as collected in the excellent dissertation of P. A. Lair.

The explanation of this phenomenon may be thus attempted. Among persons addicted to spirituous liquors, the blood is charged with a greater proportion of phlogiston and carbone than are carried off by respiration. These are carried round with the circulating blood, as are the inflammable parts of the ardent spirits. The qualities which they possess are imparted to the organic mass. If a chimney fire, a candle, or a stove, is applied to a body so predisposed to inflammation, it may be expected that it will take fire, and possibly burn up. Every body recollects the experiment with which the celebrated *Bucquet* used to amuse himself. This was the more surprising as he was fully acquainted with the whole danger of it. He had accustomed himself to take ether, to the amount of half a pint per day; and he could, by aid of a candle, set his breath in a blaze, so charged was it with inflammable matter. It may be questioned whether any of these combustions are truly spontaneous, since all the relations given of them make mention of a lamp, a candle, or a fire, in the neighbourhood of the scorched remains of the body. In this, and similar cases, the combus-

tion was evidently internal; since, in Mrs. B.'s instance, all was over in three hours; whereas, in piles constructed for burning criminals to death, eight or ten hours are necessary to reduce the body to ashes, under the hottest fire the executioners can raise. *Gazette de Santè.*

Frost in July, within New-York, Vermont, Canada, and Massachusetts.

[Extract of a letter from Major Joel Davis to Dr. Mitchill.]

"ON the night between the 17th and 18th of July, 1810, at Trenton, Oneida County, where I was, in the State of New-York, there was a severe frost, so as to injure beans and corn; and in some places black frost, with ice as thick as an half eagle."

Letters from Chenango county state, that they experienced a severe frost on the night of the 18th, which had greatly injured the crops of corn. Ice in many places was found the 8th of an inch thick. *Columbian.*

A gentleman from Chenango county, informs us that the frost was so severe in the vicinity of Oxford, on the night of the 18th inst. that corn, &c. in high and exposed situations, was much damaged, and in some fields completely destroyed. Ice of the thickness of window glass, was found in some places. *Balance.*

Extract of a letter from Mountpelier, (Vt.) dated July 17. "It is so cold here to day that the people wear their great-coats in mowing, and there was a frost on Saturday night that killed part of the corn, and we were fearful it would much damage the English grass."

It was noticed in the town of Pittsfield, (Mass.) on the morning of the 18th instant, half an hour after sunrise, that there was a considerable frost then on the ground. There has not, perhaps, been an instance of the kind for several years in this country. It is feared the gardens had sustained considerable injury by it.

On the 17th July, in the Province of Quebec, the frost was so severe that most of the cultivated plants were injured; and what is more remarkable, some of the wild plants were entirely destroyed.

Plaster of Paris in Madison County, N. Y.

Extract of a letter to the Editor of the Utica Gazette, dated "LENOX, August 4, 1810.

"I LATELY informed you that gypsum had been discovered in Sullivan. I now send you a sample of the purest which has been found. The greatest part of this valuable article discovered is of the grey kind, but there are veins of the transparent, such as is herewith sent. Yesterday I went and examined the quarry, in company with the proprietor, Jacob Patrick, Esq. Such experiments have been made by a number of good judges, that there remains not a particle of doubt, on my mind, that this is equal, if not altogether superior, to any imported gypsum. The quantity is inexhaustible, but a few rods south of the Seneca turnpike, and obtained by digging a few feet below the surface of the earth. You would doubtless confer a favour on your numerous subscribers, as well as your country, by giving this account of an important discovery publicity, through the medium of your paper."

New and copious Salt-Well at Montezuma, on the edge of the Seneca River.

[The following letter from Mr. Elnathan Andrews, superintendent of the Cayuga salt-works, dated Montezuma, August 2, 1810, discloses another source of brine, in addition to the abundant fountains known before.]

To the Hon. Samuel L. Mitchill.

SIR,

IN consequence of your calling last summer to view our salt-works, I take the liberty of informing you of the experiment I have made in digging a well, and send you a bottle of the water, hoping that you may think it worth analyzing: perhaps it may be of public utility. I began digging in an old well about 50 feet deep: I found 16 feet of hard substance, a kind of blue indurated clay with limestone, then 18 feet of sand, (some red and others black,) and one foot of gravel, then about 12 feet of red clay mixed with sand and

limestone very hard, then a hard kind of sand, to the depth of 96 feet from the surface of the marsh, or total depth, when a large stream of water found its way into the shaft. I immediately sounded with an iron bar, and found three feet four inches quicksand, over a hard bottom like rock, but could not approach it for the water. This had the colour of red lead mixed with water. The pressure of the water has raised the sand between 15 and 16 feet; and the water has risen at the rate of about two feet in an hour for this 42 hours—the first 40 feet at near double the same rate. From strange appearances in the well before it settled, I have been induced to forward this bottle of water, and shall be very glad to know all its different properties; believing, as I do, that many great and lasting benefits frequently arise from such experiments.

Quitman on the popular prevalence of Magical notions.

IN this enlightened age and country there are, even at this day, many traces of magical delusion. The figure of the human body, as influenced by the twelve signs of the zodiac, is annually prefixed to one of the most esteemed almanacs of New-York. Many persons are so persuaded of the value of this remnant of judicial astrology, that they can permit themselves to be bled, or suffer a pig to undergo castration, with consulting the almanac to know where the sign is.

The prohibition of palmistry, fortune-telling, and such-like crafty arts, by a special statute of New-York, is an acknowledgment by the legislature that their prevalence endangers the peace of society to a great degree, and that the authority of the magistracy ought to be interposed.

The strong belief in the tales propagated a few years ago of the girl that was bewitched near Poughkeepsie, the credulity which was manifested since on the dancers to the devil's music at Tarrytown, and the unshaken faith generally reposed in the enchantment which secures the money buried by the pirates on the sea coast of the middle states, are all of them proofs of the deep and extensive rooting of these erroneous notions in modern society.

With the laudable intention of exposing and eradicating

these errors and delusions, the Rev. Frederick Henry Quitman, Professor of Divinity, President of the Lutheran Clergy in the State of New-York, and Minister of the Gospel in Rhinebeck, has written a learned and sound treatise on Magic, or on the supposed intercourse between spirits and men. In this memoir, which has lately been published, are embodied the leading sentiments in the writings of the German professors, EBERHARD and TIEDEMAN, on the same subject.

This curious tract comprehends the definition of magic, as the art of producing supernatural effects by spirits; the history thereof as a propensity of the human mind, prone to credulity, and curiosity about the future; the accounts extant about it among the Chaldeans, Persians, Egyptians, and Greeks, of old; as also among the Jews and Christians.—The connection of magic with physic is plainly stated; as is also the relation it bore to the civil polity and theological system of the middle ages. The origin of the black art, and of leagues with Beelzebub, is given as practised in the time of Charlemagne. Almost every body believed in magic. The history of the Theurgists, Theosophists and Mystics, is given down to the times of Swedenborg and Cagliostro, Schroepher and Gassner.

Having traced the literary and natural history of magic thus far, Dr. Q. proceeds to examine whether supernatural beings can possibly affect men, or enable them to perform supernatural operations; whether it is probable there is any such intercourse between the natural and spiritual world; and whether there are any certain proofs of witchcraft and enchantment, or of other magical practices. After a very analytical and able examination of each of these propositions, he decides them severally in the negative. His inquiry into the human faculties evinces a logical and perspicacious mind. The object is of the most liberal kind; to eradicate superstition, illusion, folly, and deceit: and it is worthy of special remark that Dr. Q.'s account of the Egyptian sorcerers, of the Witch of Endor, and of Simon Magus, are excellent pieces of medical as well as of biblical criticism.

The prevalence of magical notions among the people is significantly told by Dr. *Nathaniel Miller*, of Suffolk county, in his letter to Dr. Mitchill, a member of the legislative assembly, dated

"MORICHES, (L. I.) March 12, 1810.

"You will excuse my presumption in addressing you, when I assure you it is to establish the respectability of that profession of which you, Sir, are one of its worthiest members, and to promote the general good of society. In this county medical imposture is carried to great extent. It is to me a doubt whether it is surpassed in any county in the state. There are itinerant and some resident pretenders to a knowledge of curing diseases, who seriously impose upon the credulity of the inhabitants under the popular names of ROOT and WITCH DOCTORS. These pretenders have no more knowledge of the operations of the human body in health or disease than a horse. The statute of this state regulating the practice of physic, makes no provision for the prevention or punishment of such impostures and nuisances. I submit to your superior judgment whether such provision in our laws would not be the means of producing a happy effect. The imposture above spoken of is far from being agreeable to the feelings of the regular bred physicians of the county of Suffolk, and it would be their general wish to have some law for the prevention and punishment of it.

Reconcilement of the Old and New Chemistry.

THE Bakerian lecture before the Royal Society of London, read Dec. 15, 1808, contains further accounts than those we gave in our vol. xi. p. 434—438, of the application of electricity to chemistry. The elementary matter of the volatile alkali, and the constitution of phosphorus, sulphur, charcoal, diamond, and of the boraric, fluoric and muriatic acids, were severally the subjects of investigation.

1. The metallic nature of potash had been previously ascertained. In its ordinary condition it is an oxyd. The metal has a very powerful attraction for oxygen; but this may be dislodged by means of the voltaic battery, and by ignited iron. A metallic substance is left after this separation. This has been conceived to be pure potash; yet the facts do not warrant such a conclusion. The new product would rather seem to be a compound of potassium with hydrogen. In the galvanic process the potassic base acquires

the hydrogen from the zinc of the plates. In the operation by the furnace the same ingredient is derived to the nascent metal from the iron.

The flash of this new metal on exposure to the air, merely shows its stronger attraction for oxygen than for hydrogen; the latter being immediately expelled to make room for the former, and exploding at the moment of separation, on account of its rapid union with oxygen. Thus an oxyd of metal, potash, and an oxyd of hydrogen, water, are instantly formed.

Professor Davy has proved that potassium is very soluble in hydrogen; that by aid of heat the inflammable gas dissolves a large quantity of it; but he thinks that, in common circumstances, potassium does not absorb hydrogen. (Philos. Transactions for 1809, part i. p. 57, 58.) The true interpretation of the experiments, however, lead to the conclusion that potassium, after having combined with hydrogen enough to saturate it and render it metallic, has but a feeble capacity to unite with more; though, under favorable circumstances, a further union may take place.

There cannot, therefore, remain a doubt that, in the experiments upon ammonia, by means of metallic potassium, a part, at least, of the hydrogen was evolved from the potassium.

2. It seems at last to be admitted that sulphur contains hydrogen. This is so plain and palpable that nothing but the most determined opposition to the phlogistic theory would ever have ventured to deny it. At length it is conceded, on the ground of sober voltaic experiment, that "the "existence of hydrogen in sulphur is fully proved, and we "have no right to consider a substance which can be pro- "duced from it in such large quantities merely an acciden- "tal ingredient." (Ibid p. 62.)

3. Phosphorus exposed to a powerful stream of voltaic electricity, also afforded hydrogen, in the form of a "gas, "which proved to be phosphurated hydrogen;" and in one experiment, continued for "some hours, a quantity estimated "to be nearly equal to four times the volume of the phos- "phorus employed, was given off." Hydrogen is thus a constituent ingredient in phosphorus.

As far as a candid opinion can be formed upon these developements of science, how can we avoid concluding that the old arguments in favour *of a common principle in all bo-*

dies burning with flame, have received new force from the severity and acuteness of modern research? and that the Lavoisierian theory, when limited and modified so as to quadrate with this important and fundamental fact, will admit of an elegant application to both the old and the new phenomena?

Information concerning the New-York Hospital.

1. *Report to the Legislature for* 1809.

DURING the last year, one thousand and sixty-seven patients have been received, who, with two hundred and fifty remaining in the house at the time of the last *report*, make together one thousand three hundred and seventeen, who have been under the care of the institution in the course of the year. Of this number, seven hundred and seventy-seven have been *cured;* forty-five *relieved;* one hundred and sixty-two discharged, either as disorderly, by request of their friends, or as *incurable*, or sent to the *Alms-House;* twenty-two have *eloped;* one hundred and nine have *died*, and two hundred and two now remain in the house.

Of the patients above mentioned, one hundred and twenty-four have been lunatics; of these, forty-eight have been *cured;* four *relieved;* six have *eloped;* sixteen discharged, by request of their friends; eight have *died*, and forty-two now remain in the house.

The whole amount of expenditures, from the 1st of January, to the 31st of December, 1809, inclusive, is thirty-nine thousand five hundred and fifty-eight dollars and five cents.

The receipts of the hospital, during the same period, including the annuity granted by the legislature, amounted to thirty-two thousand and ninety-six dollars and forty-six cents; so that there is now due from the hospital, including what remained unpaid the last year, the sum of twenty-two thousand four hundred and seventy-eight dollars and fourteen cents. This increase of expenditures, beyond the amount of the preceding year, and consequent augmentation of debt, has been owing to necessary and expensive repairs made to the old building, to the completion

of the asylum for lunatics, and to the increased price of articles indispensable to the comfort and cure of the patients. These expenses, added to those of building and maintaining the asylum, have nearly exhausted all the funds of the corporation, except those derived from the annuity granted them by the State, and the compensation received for pay-patients; and the governors have to fear that there will be no way to discharge the debt of the institution, without confining its charity to a smaller number of objects, unless the legislature should, with their accustomed liberality, supply them with means. And considering the extensive utility of the institution; that it provides for those only who are, of all others, most worthy of compassion; that its charity can scarcely ever be misapplied; that it takes charge, at a trifling expense, of lunatic paupers, who otherwise would be burthensome to the towns throughout the State, and procures them assistance and comfort, which no where else could so effectually be afforded them; that it is of the highest importance to the medical school of New-York, and honourable as well as useful to the State in general, the governors trust that the legislature will not suffer any of its benevolent objects to be defeated, or render it necessary, for want of adequate means, to withhold their aid from any of the unfortunate victims of disease.

M. CLARKSON, President.

THOMAS BUCKLEY, Secretary.

The diseases under which the patients laboured, were as follow, to wit: Abscess 19, amenorrhea 4, anasarca 16, asthma 4, abortion 1, ascites 1, burn 13, cancer 2, caries 1, catarrh 12, cephalalgia 3, cholera 2, consumption 53, contusion 35, constipation 2, cynanche tonsillaris 4, cataract 2, concussion 2, debility 10, diarrhœa 14, dyspepsia 3, dysentery 20, dropsy 8, dislocation 3, disabled 1, erysipelas 6, enteritis 3, elephantiasis 1, epistaxis 1, excrescence 1, eruptions 1, fever 76, fistula 11, fracture 24, frosted 22, gonorrhœa 14, gravel 1, gastrodynia 1, hœmorrhois 2, hæmoptysis 4, hepatitis 5, hydrocele 2, hernia 5, hydarthrus 11, hydrothorax 1, herpes 2, hydrocephalus 1, hemiplegia 4, hypochondriasis 3, injured spine 3, inflammation 5, incontinence of urine 1, jaundice 1, lumbago 1, mania 124, menorrhagia 1, ophthalmia 17, odontalgia 1, paralysis 11, paraphymosis 2, poison 1, pneumonia 38, pregnancy 39,

rheumatism 139, swelled testicle 11, pox 239, scrofula 3, sprain 10, stricture 1, physconia splenica 1, sphacelus 1, suppression of urine 2, small-pox 2, tumours 9, vertigo 1, ulcers 173, wounds 37—Total 1317.

And these patients belonged to the several countries of the earth in the following proportions; that is to say, to the United States 650, Africa 12, Denmark 18, East-Indies 4, England 98, France 21, Germany 20, Holland 12, Ireland 375, Italy 3, Portugal 3, Prussia 6, Spain 4, Sweden 30, Scotland 38, West-Indies 18, unknown 5.—Total 1317.

2. *Deliberations thereon.*

On the 6th of March a resolution was received from the Senate, appointing a joint committee to take into consideration the report of the governors of the hospital, communicated to the legislature this session: and appointing Messrs. Tayler, Burt, and Selden, on their part. To this the Assembly agreed, and appointed Messrs. Grosvenor, Mitchill, W. Livingston, Pratt, and Barker, to meet them.

It was concluded, in this joint committee, that a further appropriation ought to be recommended; and that leave should be asked to introduce a bill for that purpose into the Senate.

3. *Grant of* $ 3,500 *additional, for ten years.*

An Act for the further support of the New-York Hospital, passed March 23d, 1810.

Be it enacted, by the people of the State of New-York, represented in Senate and Assembly, that there shall be paid to the treasurer of the New-York Hospital, for the time being, out of the monies arising from the duties on goods sold at auction in the city of New-York, three thousand five hundred dollars per annum, for the space of ten years, from the passing of this act, to be paid quarter yearly, in four equal payments; and the first quarter to be paid on the first day of August next, and quarterly thereafter, for and during the above term of ten years: Provided always, that at any time within the period aforesaid, the legislature may repeal this act.

4. *Renewal of Charter, and alteration of style.*

By an act passed March 9th, 1810, this Corporation was confirmed and renewed, with an altered title, which now and henceforward is known in law, as "The Society of the New-York Hospital."

5. *Officers elected, May* 15, 1810.

(a) GOVERNORS.

Matthew Clarkson, *President.*
Robert Bowne, *Vice-President.*
Thomas Buckley, *Secretary.*
Thomas Eddy, *Treasurer.*

Peter A. Jay, Jacob Sherred, Thomas Franklin, Ebenezer Stevens, William Johnson, John B. Lawrence, Jonathan Little, John Murray, jun. Valentine Hicks, Andrew Morris, Samuel Mott, John P. Ritter, Frederick Depeyster, James Scott, John R. Murray, John L. Bowne, William Denning, Najah Taylor, John Bogert, John T. Champlin, Matthew Franklin, Benjamin D. Perkins.

(b) Physicians to the House—Samuel L. Mitchill, Edward Miller, James S. Stringham, William Hammersly, John C. Osborn.

Physician to the Lunatic Asylum—Archibald Bruce.

(c) Surgeons—Wright Post, Richard S. Kissam, Samuel Borrowe, Valentine Seaman.

(d) Household—Noah Wetmore, Superintendant.
Peter H. Cole, House-Physician and Librarian.
Caspar W. Eddy, House-Surgeon.
Richard Sadleir, Apothecary.
William Green, Clerk.

Note.—The generosity of the Legislature to this institution has frequently been shown, but never in so distinguished a manner as by the "Act for the better and more permanent support of the Hospital in the city of New-York," passed 14th March, 1806. This highly liberal statute is in the following words:

"Whereas it has become necessary, on account of the increasing number of patients in the hospital, to enlarge the

same, by erecting additions thereto, for the more convenient accommodation of the sick and disabled, and particularly to provide suitable apartments for the maniacs, adapted to the various forms and degrees of insanity: and whereas the said hospital is an institution of great public utility, and humanity, as well as the general interests of the state, require that fit and adequate provision should be made for the support of such an infirmary for sick and insane persons:— Therefore, the better to enable the governors of the said hospital, by means of a permanent fund, to maintain and improve the said hospital:

"*Be it enacted*, &c. That the Treasurer of this State, shall, every year hereafter, and until the year one thousand eight hundred and fifty-seven, upon the warrant of the comptroller, pay to the Treasurer of the Society of the Hospital, in the city of New-York, in America, for the use of the said corporation, in quarter-yearly payments, out of any monies in the treasury not otherwise appropriated, the annual sum of twelve thousand five hundred dollars; the first quarter-yearly payment to be made on the first day of May next; which said annual sum of twelve thousand five hundred dollars shall become chargeable upon the duties on sales at public auction, or vendue, in the said city of New-York.

"*And be it further*, &c. That the act entitled "An act to continue the provision for the public hospital in the city of New-York," passed 2d March, 1805, be, and the same is hereby repealed.

"*And be it further enacted*, That the governors of the said hospital shall make an annual report of the state of that institution to the legislature."

History of the Forest-trees of North America.

IN our Hex. 2, vol. ii. p. 406, and vol. vi. p. 298, we made distinguished mention of the travels and researches of Francis Andre Michaux, in the United States. He has, since his arrival in Paris, issued proposals for a publication, to be entitled "*Histoire des arbres forestiers de l' Amerique septentrionale*," &c. He proposes to treat of them as relates to their usefulness in the arts, and their employment in commerce, as well as to the advantages they

promise to the governments of Europe, and to persons who are desirous of establishing large plantations of them. The work is to consist of twenty-five numbers, to be published once a month. Each is to consist of six figures and descriptions; the latter by Mr. M. and the former by Messrs. *Redouté* and *Bessa*, the celebrated artists in natural history. The first number was promised in French at Paris, on the first of June, 1810; and a translation of the same into English is announced in Philadelphia, by Bradford and Inskeep, for the first of January, 1811.

Mr. Michaux observes, that the preservation of the forests has been considered so important in France and Germany, that the greatest pains have been taken for their improvement. It was known that North America contained, in her vast woods, an exceedingly great variety of trees. The number of these, in the United States alone, amounts to nearly an *hundred and fifty species*, while in Europe they reckon *scarcely forty*. Experience has shown that several of them, when transferred to Europe, had grown perfectly well in its soil. The minister of the finances, guided by views of general utility, decided, on examining the report submitted to him, that those foreign trees, whose wood was already ascertained to be of good quality, should be propagated in the forests of the empire; and that inquiry should be made concerning the intrinsic qualities of those which were but imperfectly known. The object of these researches was to have fixed ideas on the subject. It was in consequence of these considerations that the author's third voyage was determined on to the United States. Thither he arrived about the commencement of 1806.

During his abode in the country, he forwarded to France numerous packages of seeds. He spent a considerable portion of his time in collecting practical information on the different degrees of value in the arts, possessed by the various sorts of wood. To collect information, he performed several long and expensive journeys. From the district of Maine, where the winters are as long and as rigorous as they are in Sweden, he traversed the Atlantic States quite to Georgia, where, for six months of the year, the heats are as intense as in the West-Indies. He made five other excursions into the interior of our country: the first, toward the sources of the Kennebeck; the second, from Boston to Lake Champlain; the third, from New-York to

Lakes Ontario and Erie; the fourth, from New-York to the banks of the Monongahela, Alleghany, and Ohio; and the fifth, from Charleston, in South-Carolina, to the head waters of the Savannah and Oconee.

Mr. M. relates that he has spared no pains to visit ship-yards and magazines of timber. He has consulted the most experienced workmen, both natives, and emigrants from Europe, on the comparative qualities of the timber of the two continents; and he will state the American species which enter into the commerce of the Northern, Middle, and Southern States, and those which are exported to the West-Indies and to Europe; as well as the parts of the interior whence they are procured, and the sea-ports from which they are shipped. He will also treat of wood for fuel, bark for tanning, and of many economical particulars concerning both.

In his progress, from North to South, he paid particular attention to the appearance and disappearance of the various kinds of trees, either as influenced by a milder temperature or a change in the quality of the soil. He collected, in the different States of the Union, all the vulgar names, for the purpose of attaching them to the scientific; and he observed the forests, with the view of determining how far they were indigenous, and to what degree they were altered by the neighbourhood of civilized man and of domestic animals, whose presence rapidly changes the face of nature. He will likewise make known the species of trees which he thinks it worth the while merely to propagate in the European woods, and those which only deserve a place in parks and gardens, on account, diversified as they are, of the remarkable beauty of their leaves and flowers.

The work will exhibit the trees by families: thus the pines, the hickories, the maples, &c. will be associated into genera, and thereby each division will possess an individuality and a distinctness, independent of the rest.

Description and Analysis of the Meteoric Stone, which fell at Weston, the 4th December, 1807.

[David Bailie Warden, Esq. Consul-General of the United States at Paris, has communicated to the Editors the following particulars.]

DESCRIPTION.

THIS aerolite presents, in general, the same characters as those hitherto examined. It is enveloped with a thin, black, and uneven crust. The mass is principally composed of a granular substance, which breaks easily: it has an earthy appearance, and a grey cinerous colour, which, in certain parts, passes to a whitish grey.

Those portions, which possess this last tint, and which are as if glued in the mass, have a round form, so that they are distinguished by circular or oval spots, which interrupt the general colour. Its specific gravity is about 3, 3: the sharp parts cut glass.

In observing the fractured parts of the stone, we there perceive: 1st. Particular globules, which are easily detached; little cells, in which they are placed, and of which the substance is like that of the stone itself, except that its grain is more compact, and its fracture smoother.

In exposing it to a strong light, we see traces of a lamellar tissue. 2d. Grains of metallic iron, which, by polish, assume a whiteness, yield to the hammer, and attract, very sensibly, the magnetic needle. 3d. Grains of oxyded iron of the colour of rust. 4th. Metallic particles extremely small, of a silver white colour, which seem to be of iron: and this opinion is strengthened, when we recollect, that the native iron of Kamerdorf, and that of pseudo-volcanic origin present, in certain parts, a silver white-colour.

I have not seen any mark of sulphurated iron, although I found it by the analysis, as will hereafter appear.

All the fragments of this stone have a magnetic property, but without polarity; and the iron, which is very visible in certain parts, is so disseminated in all others, where it escapes the eye, that the property, of which there is question, manifests itself even in the smallest particles isolated by trituration.

I found it even in the globulous bodies which are first mentioned.

Pieces of this stone weighed from 6 to even 100 pounds.

ANALYSIS.

Having ascertained, by preliminary essays, that this stone contained chrome, nickel, iron, manganese, lime, magnesia, silex, alumine, and sulphur, I employed the following method of separating each of these substances.

1st. 100 grains of this stone, from which the metallic iron was isolated, by means of the magnetic needle, after being pulverised, were treated with a considerable quantity of water, through which was passed a current of oxygenated muriatic gas: by this means, the sulphur being converted into sulphuric acid, by the oxygen of the oxygenated muriatic acid, sulphats and muriats were obtained.

2d. The whole was evaporated to siccity, and treated with two parts of alkoholic potash: after fusion, the mass presented a fallow colour, and its dissolution in water was of a fine yellow.

3d. The portions of the mass, which remained undissolved in water, were dissolved in an excess of muriatic acid, and being evaporated to siccity, I separated the silex, which, after calcination, weighed 41 grains.

4th. Into the muriatic acid was poured carbonat of potash in excess, which formed an abundant precipitate after an hour of ebullition.

5th. The liquor contained sulphat and chromat of potash: after being made acid, it was precipitated by muriat of barytes in excess, and there was obtained sulphat of barytes, corresponding to 2 1-3 of sulphur: and saturating afterwards the excess of acid by an alkali, I obtained chromat of barytes corresponding to 3 1-3 of chromic acid.

6th. The precipitate, No. 4, was submitted (still in a humid state) to the action of alkoholic potash, and after filtration, the liquor gave, by means of the muriat of ammoniac, a grain of alumine.

7th. Ammoniac was poured into the remains of the precipitate, after having dissolved it in an excess of muriatic acid. The oxyds of iron and manganese were precipitated, and the lime and magnesia remained in dissolution.

8th. The precipitate was isolated, and the lime separated

from the magnesia by the oxalat of ammoniac, which, after calcination, weighed 3 grains.

The magnesia was precipitated by caustic potash: it weighed, after dessication, 16 grains.

9th. The oxyds of iron and manganese were dissolved in an excess of muriatic acid, and pouring, by little and little, saturated carbonat of potash into the dissolution until red floccules were visible, and then leaving it to repose 24 hours, all the carbonat of iron precipitated, whilst that of the manganese remained in the liquor.

The carbonat of iron, after calcination, gave 24 grains of oxyd; and that of manganese, deposited by ebullition, by the same operation, only 1 1-3.—Which makes in all—

Silex	41
Sulphur	2 1-3
Chromic acid	2 1-3
Alumine	1
Magnesia	16
Lime	3
Oxyd of iron	30
Oxyd of manganese	1 1-3
Loss	3
Total	100

Analysis of the metallic iron isolated by the magnetic needle. 1st. 100 parts of this stone gave 28 of metallic iron, which is very brittle, owing to the nickel it contains. 2d. 40 grains of this iron were dissolved in nitro-muriatic acid; and by means of ammoniac in excess, the oxyd of iron was separated, which weighed 45 grains. The dissolution of nickel, in this alkali, was evaporated to siccity, to expel all the ammoniac. The oxyd of nickel was re-dissolved by muriatic acid, and precipitated by the prussiat of potash, which gave 1 grain of the prussiat of nickel. We may infer, from these physical characters, and results of chemical analysis, that this stone is like all other meteoric stones hitherto known.

Paris, March, 1810.

For further information concerning meteoric stones, see our vol. 11th, p. 202—213; ibid. p. 418—421; vol. 13, p. 189—190; ibid. 262—264; ibid. 379—382; and vol. 14, p. 69 and p. 178.——*Edit.*

BILL OF MORTALITY,

For Newport, Rhode-Island, for A. D. 1809.
Communicated by Dr. David King.

COMPLAINT.	AGE.	Males.	Females.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
Abscess Lumbar	20 years	1							1					1		1
Anthrax	73 years		1													1
Aphtha	1, 2 weeks	1	1						1			1				2
Apoplexy	73, 47, 44, 87, 50 years	1	4	1			1			1	1	1	1			5
Asthma Suffocat.	2 m 4, 3, 2 days	2	2			1	1	1	1					1		4
Atrophy	70, 69, 73, 76 years	2	2					1		1		1	1			4
Cancer	67 years		1					1								1
Cholera Infantum	1, 2, 9 months	1	2							1		1	1			3
Colic	77, 30, 60, years	2	1			1						1		1		3
Consumption	43, 27, 21, 37, 28, 38, 35, 22, 74, 44, 22, 35, 55, 20, 22, 21, 22, 29, 40, 20, 28, 22, 31, - - - - - - - - years	9	14	4		3	1	3	2	2	2	1	2	1	3	23
Convulsions	2. 2 m 8 m 3 d, 2 d, 1 d, 4 d, 2. 2. 6 m years	4	6			1	2		2		1	2	1	1		10
Croup	5 years	1						1								1
Dropsy	75, 68, years	1	1											1	1	2
Dropsy in the brain	10, 5, years	1	1	1						1						2
Dropsy in the chest	35 years	1							1							1

Diarrhœa	62 years	1								1						1
Dysentery	24 years	1											1			1
Epilepsy	39 years		1		1											1
Erysipelas	14 d, 70, years	1	1	1			1									2
Fever from worms	7 years		1									1				1
Fever puerperal	21 years		1											1		1
Fever typhus	14 years		1								1					1
Gangrene	71 years	1											1			1
Herpes	3 months		1				1									1
Hooping-Cough 8 m, 4 m, 1, 1, 10 m, 1 m, 3 m, 1, 2, 4, 6 m, 1, y.		5	7			1	1			2	2	4	2			12
Scirrhus liver	54 years	1				1										1
Insanity	42 years		1		1											1
Old age	92, 76, 78, 80, 84, 92, 74, 80, 81, 87, years	3	7		2		2					3	1	2		10
Palsy	63, 50, 70, years	3		2			1									3
Pneumonia	28 years		1						1							1
Peripneumonia notha	67, 57, 64, years	3			1	1								1		3
Scrophula	4, 50, years	1	1				1						1			2
Scarlatina	3 months	1			1											1
Stricture of œsophagus	60 years		1				1									1
Drowned	6 years	1									1					1
Births 260.	Total,	49	60	9	6	9	9	11	8	6	7	11	14	11	8	109

Newport is situated in N. Latitude 41° 29′, W. Long. 71° 17′, and contains about 7000 inhabitants.

BILL OF MORTALITY,

For Portsmouth, Newhampshire, for A. D. 1809.

By Lyman Spalding, M. D.

COMPLAINT.	AGE.	January.	February.	March.	April	May.	June.	July.	August.	September.	October.	November.	December.	Total.
Aneurism	57· years	1												1
Angina Pectoris	18, 54. years			1					1					2
Aphtha	2. y-2. weeks		1									1		2
Apoplexy	74· 48‘ years				1						1			2
Atrophy	2. m-2. y-9. 1, 1, m 1, 1, 70‘ 60‘ 54‘ years	1	1		3		1	1	1		2			10
Cholera of infants	6. weeks						1							1
Consumption	35‘ 33‘ 22, 40. 39‘ 34· 50, 35, 32, 20‘ 15, 35‘ 36‘ 39‘ 32, 24· 35· y.	1	2	3	2			1	2	1	2	2	1	17
Convulsions	4. m 2, d 6. w 3,m 65‘ y 1.w 1. 2. 2. m 2, y 6. m.	2	1	1	1	1			1	1	2		1	11
Debauchery	58‘ years									1				1
Dropsy in the brain	1. y-8, 5. 2, months	1			1				1			1		4
Dysentery	4. months						1							1
Erythema	2. 1. 3, months		2									1		3
Fever pulmonic	78· 70· 56, 68· 69‘ 70. 77, years				2			1			1		3	7
Fever typhus	48‘ 65· years	1		1										2
Inflammation of the stomach	68· years		1											1

Mortification from ossified arteries	77. years							1						1
Old age	97· 94· 84· 78' 85' 85. 78· 81· 75. years	1	1	1	1	2		1				2		9
Palsy	69' 50· years					1							1	2
Quinsy	4. months												1	1
Scirrhus liver	55' years				1									1
Spina bifida	10. months.											1		1
Sudden	57· 67. years												2	2
Syphilis	39· years									1				1
Casualties { Choaked	5, years				1									1
Casualties { Suicide	51· years									1				1
BIRTHS { Males 146, Females 143 } 289	still born 8													
MARRIAGES 69	Total	8	9	7	13	4	3	5	6	5	8	8	9	85

Portsmouth, the capital of the State of Newhampshire, situated in 43° 5′ north latitude, and 6° 26′ east longitude from Washington, contains about 7000 inhabitants.

The town has been remarkably healthful during the whole year; the deaths have been far less than in any year since bills have been kept.

Note. This bill is so constructed as to show the complaint, age, sex, &c. and whether married or unmarried.

When a period follows the age, it denotes the male sex, a comma the female sex; when in their usual place at the bottom of the line, unmarried—at the top of the line, married.

New Medical Lectureships.

BESIDES the ample sources of medical instruction now presented to students in the two public seminaries in this city, we observe that private lecturers, of very respectable talents, have undertaken to contribute their exertions in aid of the common stock. The advancement of public medical seminaries has always been much promoted by the labours of private teachers; as thereby the conflux of students is increased, the system of education is varied and extended, and all the benefits of emulation are greatly enhanced. Proofs and examples of such good effects have been abundantly exhibited in Philadelphia and Edinburgh. The following notices of these lectures have been published.

Lectures on Anatomy, Physiology, and Surgery, by Thomas Cock, M. D.

DR. COCK, who has heretofore confined his Anatomical Demonstrations to his private pupils, intends, during the ensuing season, to enlarge his plan, and deliver a public course of instruction on that subject. He has accordingly fitted up a convenient theatre for that purpose, in the most eligible part of the city. The theatre, as well as a number of rooms connected with it, for the more convenient accommodation of the students, are well lighted, secure, and well ventilated. In these lectures, the structure of the human body will be fully and minutely demonstrated on recent subjects; and still further illustrated by the aid of dry and wet preparations. The functions of the several organs will be carefully explained, so as to comprise the more important parts of a system of Physiology. The principles of Surgery, as connected with Anatomy, will be distinctly delivered; the surgical operations will be performed on the subject; and such elucidations will be given as may best tend to form the practical and operating Surgeon. The modes of dissecting and displaying the various parts of the body will be particularly and familiarly taught; and every opportunity will be afforded to the student of practically exercising himself in these operations. The art of injecting, and of making Anatomical Preparations, will not only be practically exhibited, but the students will be instructed

and assisted to form such preparations for themselves. On every practicable occasion, exertions will be made to prosecute researches into Comparative Anatomy, so far as these may tend to illustrate the Anatomy and Physiology of the human body. As the examination of morbid bodies by dissection furnishes one of the best means of improving the doctrines of Pathology and the Practice of Physic, the attention of the student will be particularly directed to the most eligible modes of prosecuting this inquiry, and of availing himself of its advantages. The students, for their own convenience and improvement, will be divided into classes; but they will all receive equal advantages of information upon every subject, without discrimination. And from the arrangements that Dr. Cock has formed, he flatters himself that he will be enabled to obtain every thing necessary to afford them the fullest satisfaction. He will commence his course on the 8th of November, at his rooms in William-Street, and will lecture every day between the hours of 1 and 2 in the afternoon. The apartments will be open for the reception of the students at an early hour of the morning, and remain open during the principal part of the day. During those hours he will generally attend himself to lend them every assistance. The students will be regularly examined on such parts of the subject as may have been previously explained to them. They will occasionally be requested to demonstrate the different parts themselves, after the manner so successfully established in the French schools.

To render this system of instruction still more interesting to the class, DR. SEAMAN will, in the course of the season, deliver some discourses on the Principles and Practice of Midwifery; more particularly on the management of labours; illustrated by appropriate operations upon the obstetrical machine; to which will occasionally be added some observations upon the diseases of women and children.

Lectures on Surgery, accompanied with Anatomical Demonstrations.

DR. MOTT intends to make his ensuing Course of

Lectures on Surgery more extensive than that of last spring. He will treat of all the diseases and accidents to which the human body is liable, requiring surgical aid. The course of Surgery will be divided into two parts; the first will include all those cases which require operations; and the improvements in operative Surgery by the great European masters, will be particularly illustrated upon the dead body. The second part will treat of all the diseases which fall under the cognizance of the surgeon.

The demonstrations will be generally calculated to illustrate those parts of Anatomy most important to the surgeon.

The introductory lecture will be delivered on Monday the 12th of November, at 12 o'clock. The Surgery will be continued on Mondays, Wednesdays, and Friday evenings, at 6 o'clock, and the Demonstrations at some convenient hour on the other days of the week, in Columbia College.

Course of Lectures on Natural or Experimental Philosophy, and Chemistry.

J. GRISCOM proposes to give a Course of Lectures on each of the above divisions of Physical science, during the ensuing season. The subjects are to be so arranged as to make each course complete in itself, and also to have such a bearing on each other, as to illustrate the connexion which naturally subsists between them. As all the processes of art, as well as most of the phenomena of nature, are made to depend on the combined operation of Mechanical and Chemical powers, it is presumed that this arrangement will afford important advantages.

The subjects treated of in the first, or leading course, will consist chiefly of the following, viz.—Matter, its divisibility, inertia, &c. Attraction of gravitation, cohesion, &c. Motion, accelerated, retarded, and uniform; Centripetal and Centrifugal Forces; Pendulums; Mechanical Powers and Mechanism, with an account of various compound Engines, as Wheel-Carriages, Mills, Cranes, Steam-Engines, &c. Projectiles; Hydrostatics and Hydraulics, with their relation to Fountains, Aqueducts, Pumps, Fire-

Engines, &c. Pneumatics, with its relation to the Atmosphere, Winds, Clouds, Aerostation, Air-Pump, Air-Gun, Barometer, &c. Acoustics, or the theory of sound. Optics, and its relation to the Eye and Vision, to the Rainbow, Twilight, &c. to Telescopes, Microscopes, Mirrors, Camera Obscura, Phantasmagoria, &c. Light, its Composition, Refraction and Reflection; Electricity; Galvanism; Magnetism; Astronomy, including a detailed account of the planetary motions, Comets, Eclipses, Tides, Division and Equation of Time, Seasons, &c.

With the aid of a new and well-finished *Collection* of *Philosophical Apparatus*, just received from Europe, the subjects above enumerated, with such others as naturally present for consideration, will be systematized, as far as practicable, into a course of *Experimental Philosophy*.

The Chemical Lectures will embrace, in detail, the interesting subjects which appertain to that science, nearly in the same order as in former courses; with the advantage, however, of an improved apparatus, and of that assistance which the previous course will obviously afford.

Fluctuation of Chemical Theories.

[*The following observations on the Antiphlogistic Theory of Chemistry, have been obligingly communicated by Professor Coxe, of the University of Pennsylvania, in a letter to Dr. Miller.*]

THE present state of Chemical Science is such, from the extraordinary discoveries of Mr. Davy, that it is difficult to say, whether the antiphlogistic or phlogistic doctrines can be best supported. What a glorious æra would this have been to the venerable Priestley, had he lived to see so many of his controverted opinions consecrated by experience! And how would he now, Antæus-like, have gained strength by the fall, if such, which he received from his powerful opponents!

The supposition of this illustrious chemist, that oxygen enters into the composition of nitrogen, appears to be nearly verified by Mr. Davy. This gentleman, in fact, takes us by storm: undermining slowly, is ill calculated for his

gigantic genius. But whither, alas! is he bringing us? Is he, by rendering the existence of Phlogiston (Hydrogen) more than probable, as the inflammable principle, consigning the antiphlogistic theory "to the tomb of the Capulets?"—It certainly appears to stand on ticklish ground, and will, at least, require considerable modification, if Davy's experiments be perfectly correct.

Leaving these points to be settled by experiment, I proceed to the particular object I had in view, in thus addressing you. It is to oppose the explanation, held out by the antiphlogistians, of the mode by which iron, &c. is converted to a sulphate, by the action of sulphuric acid and water. To understand this more fully, I shall copy Mr. Adet's words from the 1st vol. of the Repository, p. 222, in reply to Dr. Priestley's defence of phlogiston.

"In fact," says he, "a metal, as it combines with acids only when it is in a state of oxyd, and as it takes upon itself this form by the union of oxygen only, must necessarily, as in the experiments mentioned by Lavoisier and La Place, absorb oxygen, in order to combine with an acid. But this oxygen can be furnished but by two substances, either the acid itself, or the water which it contains. If the oxygen had been afforded by the acid, this would, in part, have been decomposed, and, consequently, would have saturated less alkali after the experiment than before. But since it saturates afterwards as much alkali as ever, it is clear the acid has not been decomposed, and, consequently, the metal could have been supplied with its oxygen from *no other* source than the decompounded water."

It appears from this, as well as from the writings of the present day, (Accum, vol. 1. p, 247, 2d Eng. edit.) that sulphuric acid is not by any means considered as being decomposed in the operation under notice; and, indeed, this very process is, and has been always, one of the controverted points of the two systems. But I would ask, if the antiphlogistic opinion is correct, with what view is the acid added? If it is said that it serves to dispose, otherwise, quiescent affinities to act, I would reply, that action and re-action are considered as equal; and if the acid acts at all, it must be in turn acted on; otherwise its presence is of not the slightest use. In the present case we perceive its use is solely limited to the solution of an oxyd,

which oxyd, nevertheless, cannot be formed without its presence. But if the acid is not decomposed, why cannot the water be decomposed by the iron alone? In my opinion, (which, indeed, I have entertained since I first perused Mrs. Fulhame's excellent treatise on combustion, so far back as 1794,) the process is much better explained upon the principle of a double decomposition, by which the action of the acid is placed upon a proper footing; and, at the same time, is found afterwards in the state capable of saturating as much alkali as it could have previously done.

When water is decomposed by sulphuric acid and iron, its hydrogen escapes, but the acid is simultaneously decomposed; and whilst the oxygen of the *acid* oxydates the iron, the oxygen of the water combines with the liberated sulphur, and forms an equal portion of sulphuric acid, which immediately dissolves the oxyd. The *original* acid then, does not exist; but an equal quantity is formed from the oxygen of the decomposed water and the nascent sulphur; whilst the oxydation of the metal is effected by the original oxygen of the acid.

There is another process, in which the same explanation is given, and for the same reason, viz. that in which nitrogen gas is obtained from muscular fibre, by diluted nitric acid. We are told, that it is obvious the nitric acid does not furnish the nitrogen, since it saturates as much alkali afterwards as before, and consequently could suffer no decomposition.

That this process depends on a double decomposition, must be admitted; or the presence of the acid must be altogether unnecessary; yet it is absolutely requisite to the process. It is moreover a substance that parts more readily with its oxygen, than almost any other body we are acquainted with: hence its use in acidifying sugar, camphor, arsenic, phosphorus, &c. according to the rules laid down by our best writers.

If we suppose the nitrogen to be expelled from the flesh by the action of the acid, which, with the water, is simultaneously decomposed, we shall have a double portion of oxygen and nitrogen, which are thus re-compounded. The oxygen of the water unites to the nitrogen of the flesh, and produces a fresh portion of nitric acid. The nitrogen of the original acid escapes, and is found in the receiver; whilst the oxygen of the original acid combines with the

liberated hydrogen of the water, and produces a quantity equal to that decomposed. Hence no inflammable air appears; and hence, at the conclusion of the process, we have a quantity of new-formed acid and water, equal to the original, but in which the original elements have changed situations. In this explanation the acid retains the rank it ought to hold; and the real purport of its presence is hereby maintained.

Many other processes in chemistry may apparently be thus easily explained on principles of a double affinity; which, by being at present regarded as arising from simple affinity, are absolutely incomprehensible, and darken the subject they are intended to illuminate.

FOREIGN.

Artificial Cold.

PROFESSOR LESLIE, of Edinburgh, in following out a series of experiments on the relations of air and moisture, has, within these few weeks, been led to a very singular and important discovery. Without any expenditure of materials, he can, by means of a simple apparatus, in which the action of certain chemical powers is combined, freeze a mass of water, and keep it for an indefinite length of time in the state of ice. In the space of an hour he has, on a small scale, formed a cake of ice 6 inches in diameter, and three quarters of an inch thick. With very little trouble he can produce a permanent cold of 90 degrees of Farenheit below the temperature of the air, and might easily push it to 100 or even 110. The Professor is now engaged in prosecuting these fruitful researches, and will soon, we hope, favour the public with an account of his process, and of the chief results. [*Tilloch's Phil. Magazine.*

Case of Diabetes Mellitus.

DR. LAIRD has lately had under his care, at the Pub-

lic Dispensary, a patient labouring under diabetes mellitus, in whom the plan of depletion by the lancet, recommended by Mr. Watt in his recent publication, was employed as the principal method of treatment. The patient, thirty years of age, had been subject to the disease for about ten months. In five successive bleedings seventy ounces of blood were taken away. Although the result of this practice is imperfect, as notwithstanding the increase of strength, general improvement in appearance, and diminution of the quantity of urine, and of the quantity of saccharine extract, the disorder still continued, when the patient ceased to be under Dr. Laird's superintendence; yet we are induced to notice this case, in consequence of its tending to establish the safety of the use of the lancet in this formidable malady; and, from a hope that the safety being established, it may have the benefit of a fair trial by an extensive employment. [*London Medical Review.*

Case of Calculus removed by Dilatation from the Female Bladder.

A WOMAN named Keene, who had not been able to retain her urine since her last delivery, which was a year ago, was lately admitted into Guy's Hospital for the stone.

On the 21st of last June, a piece of sponge was, by order of Mr. Astley Cooper, passed into the meatus urinarius, and on the 22d the sponge was withdrawn, and a pair of middle-sized stone forceps were easily passed into the bladder, and a stone of one inch and a half long by one inch wide was extracted.

On the 27th she was discharged from the hospital free from every symptom of stone, but the incontinence of urine continues as before the operation.

Mr. Cooper acknowledged to the pupils that he was induced to this trial by Mr. Thomas's interesting paper on the dilatability of the meatus urinarius and rectum, published in the Medico-Chirurgical Transactions. [*Ibid.*